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Consumed by the Darkness: The Archaeological Assemblages Uncovered During the 2011 Excavation Season at the Kataphygadi Cave, on Kythera[1]

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An excavation conducted by the Ephorate for Palaeoanthropology and Speleology in 2011 at the Kataphygadi Cave on the Myrminkaris ridge in western Kythera has identified evidence of human activity in two separate periods – Late Minoan IB/Late Helladic IIA and Late Helladic IIIB–early Late Helladic IIIC – and documented the stratigraphy, and associated pottery, lithics, faunal and plant remains, as well as secondary burials. Although earlier topographical and archaeological studies had located the site and commented on the presence of archaeological remains, this study represents the first systematic excavation within two chambers of the cave, presenting detailed discussion of the geology, geomorphology, topography, formation processes, and archaeology. The paper explores possible functions of the cave in the Bronze Age and its contextual relationship to cult and burial caves on Crete and mainland Greece, and engages methodological problems of interpreting the evidence of depositional practices derived from excavation.

Introduction (by K. Trantalidou)

The island of Kythera, facing the Laconia region in the North and Crete in the South, is located at the southwestern exit of the Aegean Sea and at the crossroad of a number of routes from the Aegean Sea to other Mediterranean coastal areas. Kythera has been considered as a strategic point and a trading post and port – "the

[1] The spelling of the site names, apart from a few exceptions, follows the British library conventions. R. LEONHARD, in his geographical study devoted to Kythera (1899), was the first scholar who marked the cave on the map and transliterated the Greek name of Καταφυγάδι as Kataphygadi.

Acknowledgments. This paper is the result of the simultaneous efforts of many people, and institutions. The excavation, which lasted between 02.07 and 13.07.2011, was carried by the Ephorate of Palaeoanthropology – Speleology of Southern Greece (the director was then Dr. N. Kyparissi). The people involved in the field project were: G. Lazarides, geologist (the morphology and evolution of the cave); Ph. Stephanou, G. Karadimou (students, University of Thessaloniki) and P. Filippatou (topographical plans; Stephanou elaborated the digital edition); F. Ellinas (photographs); P-K. Trimmis, M. Evodia and K. Gerometta (archaeologists, post-graduate students, Universities of Thessaloniki and Pula); M. Agraphioti, G. Andreou, E. Konstantinidi, T. Sotiriou, and N. Stropianna (archaeologists, students of the University of Thessaloniki and Thessaly). P.-K. Trimmis was also responsible for the planning of the work, prior to the excavation, on Kythera. K. Trantalidou, Ephorate of Palaeoanthropology-Speleology, directed the excavation and edited the present text.

The following Institutions offered their generous support: the Foundations *Trifylleio Idryma Kytherion*, *Nicholas Anthony Aroney Trust* and *Assosiation Pelasgon kai Myrmidonon on Kythera "Ag. Serapheim*" covered most of travel expenses, excavation equipment, daily subsistence and the digital topographic mapping of the cave; *the Ecclesiastic Council of the Monastery of Panagia Myrtidiotissa* offered accommodation; the *Municipality of Kythera* offered the building of the old Primary School at the village of Mylopotamos that was used as a provisional laboratory; the National Centre of Scientific Research "Demokritos" offered three radiocarbon samples dating. Many locals offered their help and assistance, in particular A. Lachanas,

Fig. 1. Kataphygadi Cave: the entrance

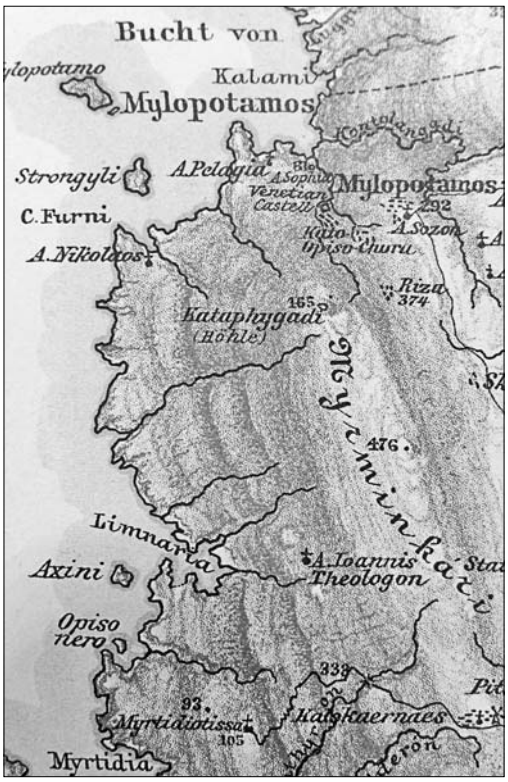

Fig. 2. Location of the Kataphygadi Cave on the map by LEONHARD (1899)

lantern of the Archipelago."[2] Our present report concerns the Kataphygadi Cave (Fig. 1), which lies on the Merminkaris ridge (507 m asl), in the western part of the island (Figs. 2 and 3).

The Kataphygadi Cave: the history of research

Only a few caves had been mentioned on Kythera before the end of the 19th century, mainly those situated in the proximity of fortresses. The caves mentioned by

A. Kastrisios, Th. Souris and N. Notaras supplied us with some of the excavation equipment and the construction of the flotation machine. The archaeological assemblages were studied at the laboratories of the Ephorate of Palaeoanthropology-Speleology. The archaeozoological material has been recorded by students of the Universities of Athens and Thessaly and in particular by K. Nikolaou, El. Bograkou and A. Chronaki. The following stuff members of the Ephorate contributed also to this article: Dr A. Papathanassiou supervised the study of human bones, N. Deilaki drew a part of pottery assemblage, the lithic implements and prepared all the digital designs, D. Bakoyiannaki and V. Trizonis prepared a part of the drawings, G. Gkioni, V. Klaridi and V. Papamikou undertook the conservation of the pottery.

To all, deep appreciation and gratitude are expressed. In this paper, the list of the contributors' names refers to their place in the text. It does not reflect any kind of evaluation.

[2] KENDRICK 1822, 81.

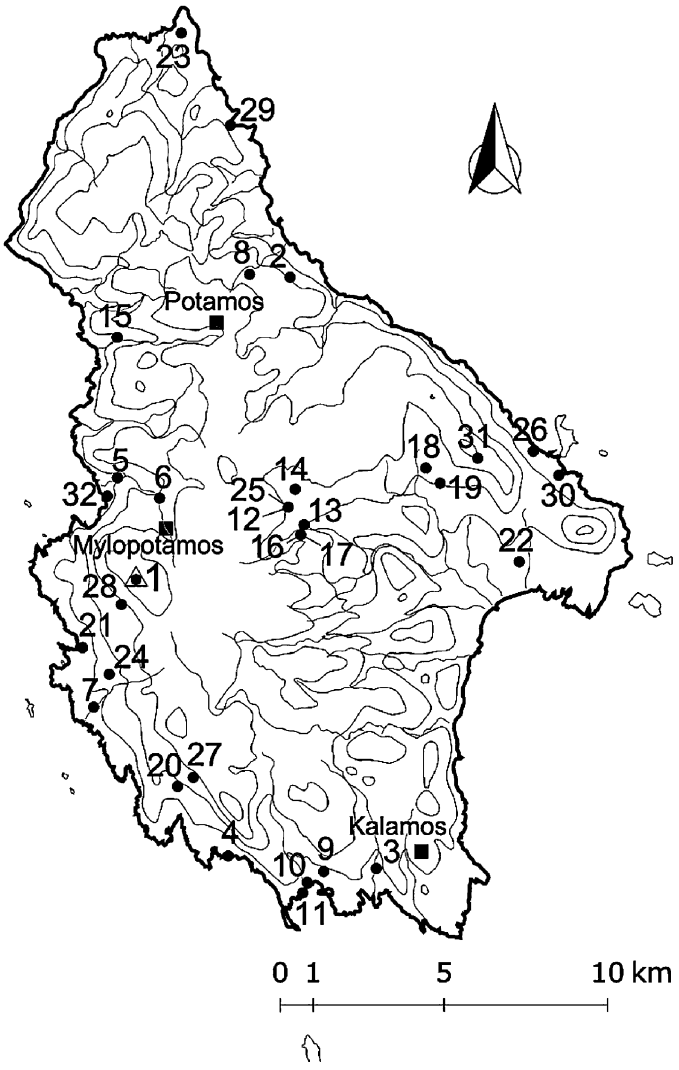

Fig. 3. Caves on Kythera (the list based on TRIMMIS and FILIPPATOU 2011; the map: courtesy of Th. Chatzitheodorou)

LEGEND

	Cave name	*Period of occupation/use*	*Current function*
1	Kataphygadi	LBA/medieval	abandoned
28	Lachno	LBA/medieval/ modern	barn
24	Stavrou	LBA/medieval	barn
30	Chousti	LBA/Cl/medieval	abandoned
23	Moudari	LBA/medieval	barn
3	Ag. Sophia Kalamou	LN/LBA/medieval/ modern	chapel
9	Ag. Ioannis en kremno	medieval/modern	chapel
10	Ag. Aikaterini	medieval/modern	chapel
11	Ag. Pavlos	medieval/modern	chapel
4	Ag.Pelagia	medieval/modern	chapel
7	Ag. Thavmatourgou	medieval/modern	chapel
32	Ag. Sophia Mylopotamou	medieval	chapel
5	Panagia Orphani	medieval/modern	chapel
6	Ag. Aikaterini Mylopotamou	medieval/modern	chapel
12	Ag. Georgios	medieval	chapel
16	Panagia Odigitria	medieval/modern	chapel
17	Ag. Antonios	medieval/modern	chapel
13	Panagia Spilaiotissa	medieval/modern	chapel
14	Ag. Ioannis	medieval/modern	chapel
15	Ag. Eleftherios	modern	chapel
8	Ag. Artemios	medieval/modern	chapel
2	Ag. Sophia, Ag. Pelagia	medieval/modern	chapel
22	Mormori	modern	barn
20	Kyklops	modern	barn
27	Vigla	medieval/modern	barn
21	Charambos Limnaria	modern	barn
25	Mavri Spilaia	medieval/modern	barn
18	Mantri tou Papa	modern	barn
19	Anonymo (C)	modern	barn
31	Tou Giorgi	medieval/modern	shepherd's shelter
26	Grias Kakomarienas	medieval/modern	barn
29	Fournoi	modern	fisherman's shelter

names were: "San Giovanni della Grotta",[3] "Grotte avec des Stallactites" (σταλακτιτικὸν ἄντρον)[4] and "a grotto in the vicinity of Milopotamo" (μέγιστον ἄντρον του Μυλοποτάμου).[5] In his topographical synopsis Leonhard noted that the "kleine Höhle" (Kataphygadi) is located in "Myrminkári" ridge at an elevation of 465 m, 300 m SW of the mountain's summit. Leonhard briefly mentioned the presence of animal and human bones, and potsherds. He assumed that the artifacts were dated to the historical periods.

[3] BELLIN (1771, 208), during his visit in 1735, described the landscape and underlined that it was a sacred place for the inhabitants. See also CORONELLI 1686, 71; EGMOND and HEYMAN 1759, 66. The same name was later used by LEONHARD (1899, 17). The actual name is Agios Ioannis en Kremnó.

[4] CASTELLAN 1808, 22, planche 2, carte; Mikelis mentioned the presence of a chapel built in the entrance of the cave (MIKELIS in ANDRISTAKI-FOTIADI and PETROCHILOS 1982, 193–194); DAVY 1842, 63 (cavern of St Sophie, "half an hour ride from Kapsali"). The cave was also indicated by the name of Agia Sophia in Kalamos (LEONHARD 1899).

[5] GALT 1812, 142; DAVY 1842, 62; probably cited also by GRASSET 1799–1800, 333 and LEAKE 1835, 76. It was I. Mikelis, an erudite from Crete, who described in detail the cave and commented on the chapel in an essay written before 1825. RIEMANN (1879–1880, IV, 19) gave the cave name as "Sainte-Sophie" in Mylopotamos, as it is nowadays.

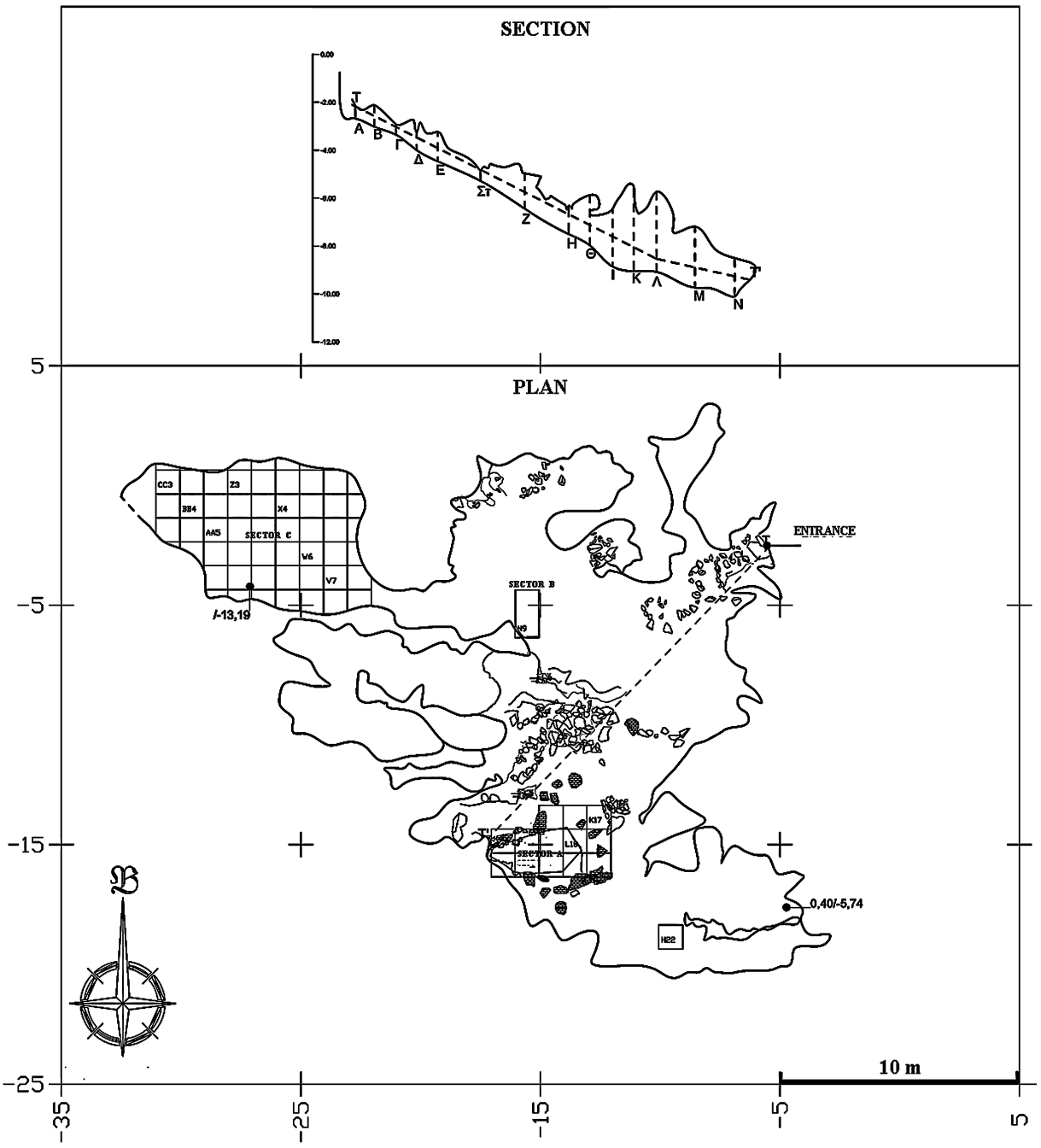

Fig. 4. Plan of the Kataphygadi Cave

One century later, in 1978, the paleontologist Bartziokas explored the cave, drew a topographical sketch and handed over three vase fragments and a human mandible to the Archaeological Museum of Kythera. The vases (a bowl and two stirrup jars) were dated by G. Korres to "LM IB (1500–1450 BC) and LH IIIA2/B1 (ca. 1300 BC)".[6] In 1983, I. E. Petrochilos mentioned potsherds (including a Mycenaean sherd) and bones on the surface in the deeper part of the cave. Having seen the pottery fragments in the Archaeological Museum, Petrochilos dated them to the LH III period.[7]

The third archaeologist, who contributed to the chronology of the cave's use was A. Tsaravopoulos. According to him, the cave was a Minoan sacred place,

[6] BARTZIOKAS 1998, 33, 92, fig. 70.

[7] PETROCHILOS (I.E.) 1984, 63–64.

probably linked to the small site on the peak of the Leska ridge, which may have been used as an observatory for the maritime route from the Peloponnese to Crete.[8]

Towards the turn of the 20th century, Kythera benefited from several archeological projects including excavations and intensive surveys in the northern and southeastern parts of the island.[9] At the same time an extensive speleological project was carried out by the Hellenic Speleological Society, which covered also the Kataphygadi Cave.[10] The topographical sketch of the cave was drawn with several interesting details; one of them, a low dry stone wall in the north-west area of the cave,[11] had been completely dismantled by the time when the excavation started.

The archaeological assemblages presented in this text do not include the vase fragments mentioned, nor the potsherds that were laying in the deepest part of the cave, as described by Petrochilos.[12]

Objectives, excavation methodology and sampling strategies

The aim of our investigations was to establish the chronology and character of human activity in the cave. The present Greek name of the cave (a refugee shelter) may refer to a more recent use,[13] but our interdisciplinary team collected enough evidence concerning the function of the cave through all the periods of its use.

A cave's morphology can facilitate or prevent some functions: horizontal caves can easily be used as animal pens but a very small entrance and an inclination of a cave's sediments are unsuitable for domestic animals; areas in complete darkness cannot host humans for a prolonged period of time. Yet, a cave configuration changes through ages due to tectonic forces, water and atmospheric erosion or chemical processes. At Kataphygadi the access inside the cave is obtained by a reduce passage (a bottleneck) (Fig. 4 and 5); the approach to several areas is difficult and can be achieved facing down on to the ground. The passage from Chamber A to B is extremely narrow. A person can remain standing in the deepest part of Chamber A (Fig. 6), in Chamber B (Fig. 7) and a small part of Sector B. The examination of the cave geological development is of a prime importance for the understanding of its long-term use.

When the excavation started, in 2011, the surface of the chambers was covered by (un)sorted loose small or medium size boulders, sometimes consolidated with calcium carbonate formations, angular slabs (10–20 cm in length), which had collapsed from the roof or slid from the entrance, sealing eventually archaeological evidence. For example, at Chamber A the surface pottery had been removed before the excavation started,[14] but in the bottleneck passage, between Chamber A and B, three potsherds, some bones and three marine gasteropods (found near stalagmite columns) were found on the sediments. In the corridors, north and south of the main chamber, pottery fragments were well visible on the surface (e.g. at Corridor C, H22 square). Human long bones (belonging probably to two different individuals) were exposed in two different recesses of the cave's north-west wall (defined as κόγχη on the topographical map, O/P4; P3), later labelled Sector B, and by the dismantled low dry stone wall. A fragment of human innominate bone was also recovered under a collapsed rock, near a vase and an iron knife fragment (see below), at a place of stalagmite recess (at H22). Numerous animal bones were dispersed through the entire surface deposit. All this material was recorded as the surface deposit.

[8] TSARAVOPOULOS 2009a, figs. 4 and 11. The idea of the integration of Kataphygadi in the Sacred Minoan Landscape was accepted by the team of the Kythera Island Project (BROODBANK, KIRIATZI and RUTTER 2005) and the excavator of Leska (GEORGIADIS 2012a). Georgiadis assumed that the Kataphygadi Cave was related to a chthonic cult (GEORGIADIS 2012a, 481) and argued that both Leska and the Kataphygadi Cave "in the highly charged cultic landscape of Mt Mermigkari must have been an important religious experience for the local inhabitants" (GEORGIADIS 2014).

[9] PASPALAS and GREGORY 2009; JOHNSON and WILSON 2003; BROODBANK 1999; BEVAN 2002; BEVAN and CONOLLY 2004; BEVAN et al. 2003.

[10] The speleological research on the island which started in the 1930s and again in the 1950s (TRIMMIS and KARADIMOU 2013 with reference in previous sources), were continued in 2002 by Department of Crete of H.S.S., and in 2008–2010, by the Department of Northern Greece of the same private association. In total, 82 cave-forms had been recorded and mapped (TRIMMIS and FILIPPATOU 2011).

[11] TRIMMIS and FILIPPATOU 2011, 205.

[12] The potsherds have been removed and handed over to the Archaeological Museum of Kythera, in Chora, by the archaeologists M. Tsaravopoulos and M. Georgiadis (personal communication) shortly before the excavation.

[13] There were certain caves on the Island named Kataphygadi which the local people used as hiding places during raides. These were situated within a reasonable distance from the settlements but were difficult to find among the bushes and the rocky, sometimes, precipitous land (LEONTSINIS 1987, 195; on corsairs and pirates see: GRASSET 1799–1800, 331). On the three other caves baring the same name, see: TRIMMIS and FILIPPATOU 2011, 32.

[14] According to Ph. Stephanou, the maximum length of the cave from the entrance to the horizontal part of Chamber A is 18 m; the maximum width of the cave is 14.80 m (Sector B). Chamber A and B have maximum dimensions 6x9 m and 10x6 m respectively.

Fig. 5. Entrance passage of the Kataphygadi Cave

Fig. 6. Chamber A – sector A

Fig. 7. Chamber B – general view

The main aim of the project was to obtain a better understanding of spatial relationships between finds. This could be achieved only by a horizontal excavation of the whole surface. The grid system was based on squares measuring 1×1 m (Fig. 4). Mapping of the contours and profiles of the cave has been done almost simultaneously. Dry-stone structures (e.g. at J16–J17 squares: 36×54×18 cm; K17; O18–O19; L5) or similar features delimiting zones in the cave were plotted according to the grid-plan.[15] Seventeen plan sections were drawn.

Surface finds collection, in the cave and the area immediately outside, had been undertaken before the excavation started. Thirty six potsherds collected in the sinkhole (a few meters in diameter) were extremely small and eroded; the fabrics were soft and fragile. In the front terrace the archaeological deposit was very shallow and density of artefacts was very modest.

The few horizontal areas (in Chamber A, Sector A and B) have been chosen and sedimentation stratigraphy was used to reconstruct the processes related to the history of the site. Each thin layer was defined by colour, texture and context, but different features (e.g. burnt lenses, pits, concentrations of rough stones) have received a different unit number. All the excavated deposits were washed and all flotation samples were treated for archaeological, bio-archaeological remains or ecofacts. At the end of the excavation, all trenches have been back-filled.

Three charcoal samples[16] were examined in the Laboratory of Archaeometry at NSCR "Demokritos". Assuming that they are not contaminated they are much later than the LBA pottery and other artifacts found nearby.

The results on the spatial distribution of artefacts, using the GIS capabilities, will be accomplished when all the material will be quantified in units and layers. The study of the site formation processes, including micromorphological and granulometric analyses, has also been planned. When all the relevant documentation is worked out conclusions will be drawn concerning the diachronic use of the cave and its relationship within the cultural landscape of Late Bronze Age Kythera, Crete and Peloponnese.

[15] Small terraces, restricted in height, could eventually be seen in the eastern part of the horizontal zone (Sector A). In the northern part of the same zone, four more terraces can be traced. However, the dozen of fallen stones make this reconstruction hypothetical. The horizontal zone (Fig. 4) is confined by 10 boulders (up to 40×40–50 cm in size).

[16] The samples came from: 1. squares N18–19 #011, where pottery deposits were unearthed in a burnt lens; 2. square N19 #018, fill of a pit including potsherds, a human metapodial and animal bones; 3. square N8 #008, where a hearth, full of charcoal and including seven animal bones, was excavated. A later reuse of the hearth seems possible.

Geology, morphology and evolution of the Kataphygadi Cave (by G. Lazaridis)

The basement rocks of Kythira consist of the marble of the Mani Unit and the Phyllite-Quartzite Unit of Arna that crops out in the northern part of the island. Above the basement rocks the formations of Tripolitza Zone (the volcano-sedimentary Formation Mirtidion, the carbonates and the flysch) of the Olonou-Pindou Zone have been tectonically placed (thrust).[17] The latter are mainly carbonate rocks. However, the Olonou-Pindou Zone was also recorded directly over the Arna Unit. Caves open in the limestone of Tripolitza and Olonou-Pindou Zones and in the Neogene deposits. They are of tectonic, karstic and littoral types. The Kataphygadi Cave is situated on Merminkaris Mt. in the cretaceous limestone of Tripolitza Zone. Flysch outcrops are exposed south of the cave. On the west the limestone bounds to the Olonou-Pindou rocks (thrust). The main faults of the area close to the cave are NNE–SSW or NW–SE striking.

The entrance of the Kataphygadi Cave is located inside a small sinkhole (5×8 m) formed at 476 m asl (Fig. 1) The cave consists of two main chambers and several blind passages. The chambers are connected at the north-western part of the cave with an inclined narrow passage. The cave area is estimated at about 350 m^2 and passage length is about 85 m, areal coverage is 46% (rectangular method) or 68% (polygon method) and passage density is estimated at 166 km^{-1}.[18] In the area close to the sinkhole there are remnants of speleothems revelling an eroded cave part.

The original morphology has been intensively altered by breakdown, favoured by low dip-angle of limestone. Boulders are commonly less than a meter in diameter and form a breakdown dome. Thus, cave floor is steeper (25–30°) close to the entrance than to deepest parts of the cave. In the second chamber the floor is covered by flowstone. The NE–SW and NW–SE striking passages are mostly fracture-guided, whereas rarely some cave passages are formed along bedding planes.

Small-scale morphology is commonly altered by breakdown or speleothem deposition. Features formed in vadose zone or by turbulent lateral flow along a pressure head are absent. Small cupolas have been observed close to the cave entrance. Two types of cupolas have been recorded: a) fracture-guided, high and elliptical,

[17] PAPANIKOLAOU and DANAMOS 1991; MANOLESSOS 1955; DANAMOS 1992; VERYKIOU-PAPASPYRIDAKOU and DANAMOS 2002.

[18] For estimating method, see KLIMCHOUK 2003.

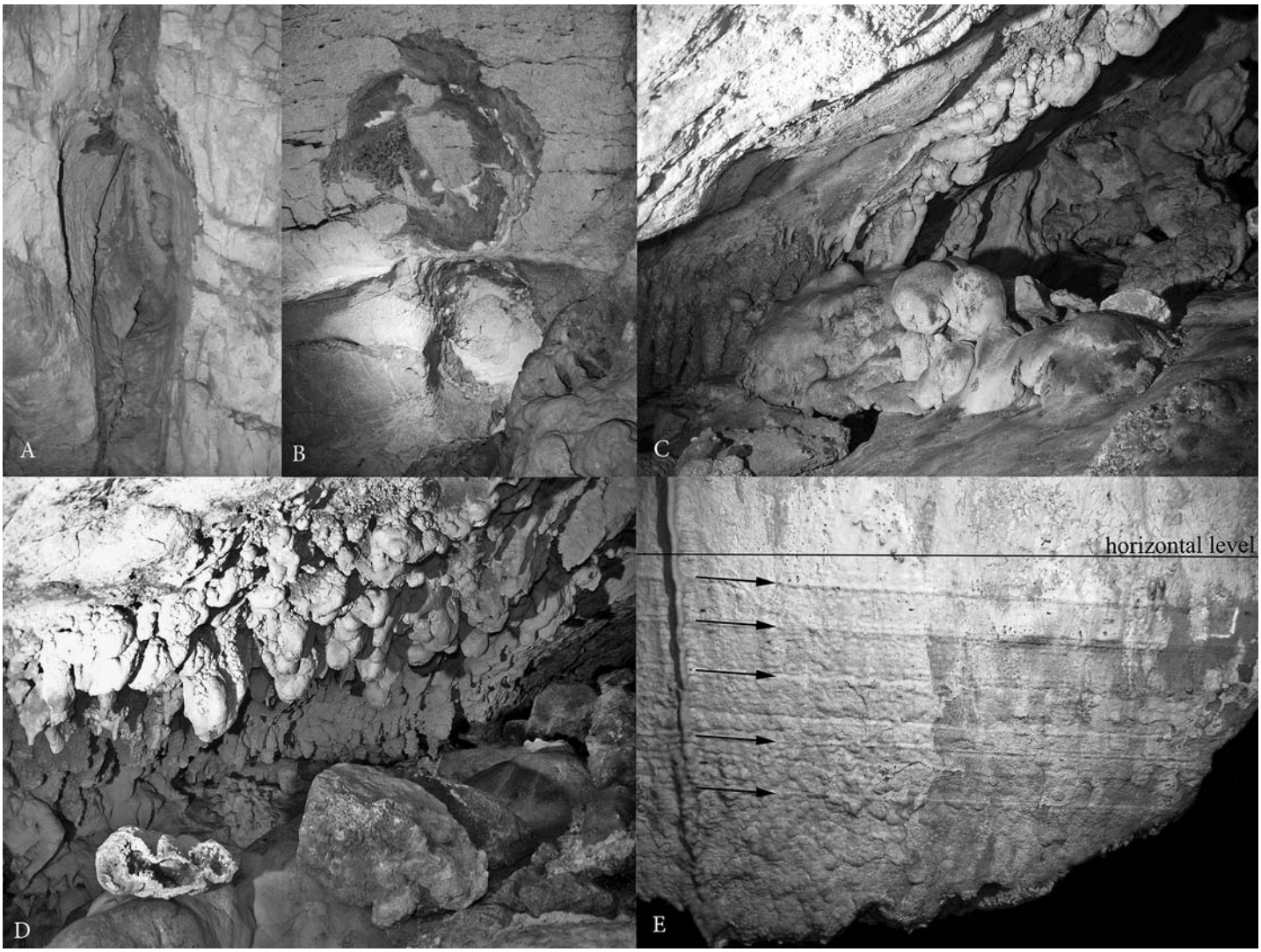

Fig. 8. Geological sections

and b) flat, almost circular in shape, wide and shallow (Fig. 8A–B and Table 1). Inside the latter type of wide and flat cupolas there are stalactites, flowstone and corroded speleothems.

The origin of a cave is commonly discussed on the basis of its morphological features, which have been related to the conditions during the process of speleogenesis.[19] The morphology of the Kataphygadi Cave is extensively affected by ceiling breakdown and speleothem deposition. The main features are the fracture-guided passages, few passages along bedding planes, few cupolas originated from at least two different processes and the cave pattern on a ground plan.

All the aforementioned features are commonly formed in phreatic conditions. The horizontal cave-pattern in terms of morphometry is similar to caves formed due to transverse speleogenesis.[20] The flysch that occurs in the southern part of the cave may have acted as a cap-rock, forming an aquifer in confined setting.

Breakdown morphology observed in the cave is post-phreatic as indicated by the boulders that cover partially the massive stalagmite complex of the first chamber (Fig. 8D). Shelfstones and sub-aqueous calcite deposits (Fig. 8C) are indicative of an extensive cave pool stage in the cave. The former are formed at various levels covering cave-walls, stalactites and draperies but not boulders of

[19] GUNN 2004; CULVER and WHITE 2005; FORD and WILLIAMS 2007; KLIMCHOUK 2007; PALMER 2007.

[20] In contrary to caves formed in unconfined setting, see PALMER 2000.

Table 1. Morphology of cupolas found in the Kataphygadi Cave, Kythera Island.

Location	*Max diameter (cm)*	*Min diameter (cm)*	*Height (cm)*	*Observations*
C1	42	17	~40	• fracture-guided • related to other smaller cupolas along the fissure • inner morphology: similarities to mega-scallops (ridge at the middle of the height)
C2	30	25	20	• no obvious relation to fractures • part of the ceiling of a small chamber with cupola morphology • separated by ridges covered by corroded flowstone

Table 2. Main stages of development of the Kataphygadi Cave, Kythera Island.

Event	*Result*	*Conditions*	*Evidence*
Phreatic speleogenesis	Main formation of the cave passage by dissolution below water table	Speleogenesis by slowly convecting water bodies possibly in confined setting	Cupolas, fracture-guided passages, horizontal cave-pattern, morphometry
Uplifting and tilting	Uplifting and drainage of the cave	Uplifting resulted in the drainage of the cave	The present character of the cave
Vadose water filled the cave	Formation of cave-pools- deposition of speleothems	Infiltrated carbonate-rich water enters the cave.	Shelfstones, sub-aqueous calcite formations
Paleo-environmental changes	Changes of the water level of the cave-pools.	Vadose conditions	Deposition of stalactites when water level lowered. Rising of water level and deposition of subaqueous calcite on stalactites
Tectonic tilting	Tilting of the cave and the shelfstones (or changes to the phreatic level)	Vadose conditions-tectonic movements	1-3o rotation of initially horizontally formed speleothems
Changes of cave altitude and/or environment	Drainage of the cave-pools	The cave becomes more “dry” and less water enters the cave forming flowstones, gours etc.	Floor speleothems without shelfstone or sub-aqueous calcite
Breakdown	Deposition of new boulders on the breakdown dome. Latest possible time of cave entrance opening.	Intense surface erosion. The cave is located close to the surface topography	Boulders that cover the stalagmite complex of the first chamber

the breakdown dome or the stalagmite complex of the first chamber. Thus, the breakdown dome formed after the cave drainage by successive ceiling collapses interrupted by the stage of stalagmite formation.

Broken speleothems at the narrow passage may be related to sediment movements below the flowstone. Fracture-guided cupolas in Kataphygadi are formed in phreatic zone[21], whereas the flat and wide ones are developed due to condensation corrosion. The decreased inclination of the shelfstone, seen in the deeper parts of the cave, may indicate continuous water level dropping related to uplifting and tilting. Events and evolution of the Kataphygadi Cave are summarised in Table 2.

Concluding, the Kataphygadi Cave has been formed in the phreatic zone below the water level, but a later regional uplifting resulted in the drainage of the cave. After the drainage, an extended cave-pool was formed with varying water level. The shelfstone formations, recorded in several locations inside the cave, are inclined 1–3° towards NE direction probably due to tectonic tilting of the area (Fig. 8E). The cave entrance, the sinkhole and the breakdown dome inside the cave are formed due to the ceiling collapse at the latest stages of the cave development.

[21] BÖGLI 1978.

The excavated area and the stratigraphic sequence (by K.-P. Trimmis and K. Gerometta)

Chamber A

Sector A

Excavation was conducted in Sector A, the only part of the cave with an almost flat surface (Fig. 6). The area corresponds to L18/19, M18/19, N18/19 and O18/19 squares (Fig. 4). This sector was defined by dry-wall on the south and north-east, and a flowstone and cave wall recess on the other sides. The investigated area was 2.20 m N–S and 4.30 m E–W in size. The surface of Sector A was covered by stones (10×6 cm), bones (visible mainly in squares N19, O18/19) and potsherds. The stratigraphy of Sector A can be described as follows:

Layer 1. Thickness 5–17 cm; thin flowstone crusts with compacted clay, charcoal and bone inclusions (#003). It may have been formed when water flows dispersed archaeological evidence and collapsed material from the ceiling.

Layer 2. A clay stratum with gravels and two ash lenses, one larger, at the northern part of the sector, and one smaller, in the southwest-southern part, between the squares N19 and O19. Layer 2 provided a few finds, mainly human bones concentrated in the northern part.

Layers 3 and **4.** These exhibited two distinct features. Eastern squares (L18/19) were covered by a stalagmite crust, almost 5 cm thick; central squares (M18/19 and N18/19) incorporated a concentration of stones into a deep brown loose deposit. Layer 4 (brown) included several distinct units, mainly ash lenses, grouped in two concentrations. In the northern ash lens (#005), five caprinae astragals had been unearthed, few of them burnt. Fragmented bones had been associated with the southwest lenses. Layer 4, in comparison with the underlying Layer 5, contained a significant amount of pottery. The quantity of pottery along with the stones, which do not form any structure, raised the hypothesis that the stones refer to an adjacent feature (or even structure), which may have collapsed within Sector A. This hypothesis can be supported by the stones visible in the northern profile. Additionally, north of Sector A, a double row of a dry stone wall has been observed.

Layer 5. It is 12 cm thick on average and extends over the entire sector except of the squares N18/19. It consisted of brown-red sediment with calcite inclusions and presented a deposit of disarticulated human bones compound with stalagmite material, which was difficult to excavate (#011–#013). For this reason, only the western and central squares were excavated.[22] Except of human bones, few animal bones were found along with two small ash lenses and an obsidian blade. On the same level with Layer 5, at the squares O18/19, a pit (1.05×1.10 m) was unearthed, filled with dark brown soil and covered by slabs and animal bones. It was excavated by spits, 50 cm thick, in order to investigate possible different depositional episodes. The fill (#017–#020) contained mainly animal bones and potsherds. Few human bones were recorded, too, but they could have been a residue from Layer 5.

Layer 6. After removal of Layer 5, a stratum was exposed with stones and breccias, which probably was arranged by the cave users (#016). At the point where this stone stratum joins the northern profile of square M18, is a shallow pit encircled with stones. The pit's filling (#021, #022 and #024) contained potsherds, human and animal bones (Table 6) and an obsidian bladelet. At the bottom of the pit, a small ash lens was found.

Layer 7. Below Layer 6, a thick reddish layer was found with no archaeological objects apart from a truncation on a blade. This layer is regarded as the non- archaeological sediments on bedrock.

The periphery of Sector A

The surface of the eastern grid squares around the flat zone in Sector A (K 17/18/19 and L 18/19) followed the natural inclination of the cave towards the main space of the sector. A thin (max 7 cm) layer of sediment was identified on bedrock. Pottery from this area includes LM and LH sherds. The most important features of these squares were the large stones that seem to be arranged in a kind of structure surrounding the depositional area of the sector (Fig. 4). The aforementioned rumbled stones unearthed in Layer 4 and those sealing up the bone's deposit in Layer 5, could probably came from this structure in K and L square series.

The sediments incorporated three distinct features: 1) The "bones" Layer 5 in the main area of Sector A reflects probably burial practices. 2) The ash lenses, with extended burnings, obsidian blades and a few decorated pottery fragments, found in correlation with Layer 5, may support this hypothesis. 3) The "stones" Layer 4 and the surrounding dry-walls and boulders in squares K and L. It is still to be clarified if these rocks and slabs were associated with the practices held in Layer 5, or mark some other activities in the cave.

[22] Thus, in squares L18/19 the excavation stopped in Layer 4.

Sector B (Fig. 4)

The part of the main chamber closest to the entrance of the cave was named Sector B. Since most of this sector was covered with flowstones, the trench was opened on a small "terrace", the only one without this material on the surface, in the immediate vicinity of the colluvium descending from the entrance. In Sector B five squares (N8, N9, O8, O7 and P7) were excavated, but bedrock was not reached. The five squares were divided into three separate trenches (N8, N9 and O7–8/P7), each one with its own number of layers and units. Starting from Layer 4 (#007), all squares were united in one trench, but the exavations stoped in squares O7–8/P7 with Layer 1 (#012). In all, six layers divided into twenty two units were explored.[23] The stratigraphy of Sector B can be described as follows:

Layer 1. In squares N8–9, finds collected in a surface layer (#001) (pottery, bones and charcoal, without sediment) were covered by and/or mixed with stones. In squares O8–7/P7, a mixed and disturbed deposit (a pit?) was found full with fragments of pottery, shells, bones and charcoal;[24] it was excavated in spits (#001, #002 and #012).

Layer 2. This is the uppermost sediment in squares N8–9 (#002); it is dark brown, very compact and solid, probably due to recent trampling.

From Layer 2 downwards the excavations continued only in squares N8 and N9. All the layers and units were formed by a silty sediment with more or less carbonatic inclusions (secondary carbonates/precipitation), except from #009 in Layer 5 which was formed by a yellowish-brown clay loam. In all of the explored layers, small fragments of stalactites/stalagmites and sub-angular to sub-rounded stones (limestone) were found. Layers 3 and 4 could be clearly distinguished only in the central part of the trench, but not in its northernmost and southernmost parts.

Layer 3. The sediment in Layers 2 and 3 was the same regarding the texture and colour, but since two superimposed rows of stones were found inside, divided by just a few cm thick dark brown sediment (Layer 3, #004 in N9 = Layer 3, #005 in N8), they were divided in different units.[25] The stones were relatively small (ca. 5–7 cm) angular to sub-angular in shape and mostly flat. Considering the slope and colluvium descending from the entrance of the cave to this small terrace, a hypothesis of a natural origin of this feature seems to be the most probable. The lower second row of stones was found only in the central part of the trench N8–9. In the same layer two possible hearths were found (#006 in square N9, # 008 in N8). In the sediment near the hearth there were some stones, but their random arrangement speaks against the hypothesis that they were part of the hearth's "construction". The impression is that both hearths might have been frequently reused. It is possible that the south-east corner of #006 (square N9) represents an ash dump. The hearth in #008, in square N8, is made of a small lens of yellow clay and a charcoal layer with ash, both above and under the lens. Below the lower layer of charcoal in #008, there was a reddish brown layer, probably a residue part of the same hearth.

Layer 4. Unit #007. Under the second row of stones (#005/N9 = 006/N8) a layer of dark brown soil was excavated.

Layer 5. Two different units were recognized: #009 is represented by a yellowish brown clay loam, a compact layer which may represent a built floor, #011 was formed by a brownish sediment, slightly less compact in comparison with #009.

Layer 6. The most important unit in layer 6 is a pit (#010) filled with a very loose sediment, angular to sub-angular stones, and stalactitic/stalagmitic material (ca. 3–10 cm thick). Around and inside the pit, larger sub-angular stones and fragmented stalagmites were found (ca. 25–40 cm). The entire pit was filled with a large amount of pottery fragments and bones. In the lower part of the pit there was an *in situ* recipient (#014), placed upside down and filled with soil with small pieces of charcoal and bones, and few fragments of ceramics.

Chamber B

During previous visits in the cave, surface pottery has been recorded in a small chamber north of the cave entrance, which is accessible through a narrow and extremely low passage. During the 2011 excavation, large

[23] The following unit numbers had been given: Layer 1: #001 and 002 in squares O7–8/P7; Layer 1: #002, Layer 2: #002 and 003–006 in square N9; #002 to #006 in square N8; #007 to #015 in the united trench which comprises squares N8–9, O8–7 and P7.

[24] Square P9 #001 includes a burnt lens 15×10 cm in size.

[25] The first row of stones has been marked Layer 2 #003 in square N9, and it is the same as Layer 2 #004 in square N8. The second row of stones was labelled Layer 3 #005 in N9, and constitutes the same feature as Layer 3 #006 in N8.

Table 3. Radiocarbon dates.

Lab. code	*Sample coordinates*	*Kind*	*^{14}C Age (BP)*	*$\delta^{13}C$ (‰)*	*Calibrated Age*	*Probabilities*
DEM – 2219	(2011), Sector A, Sq. N19, # 018, pit region	Charcoal	2235 ± 30	-24.29	374 – 211 BC 388 – 204 BC	(68.2%) (95.4%)
DEM – 2220	(2011), Sector A, Sq. M18, # 011	Charcoal	1774 ± 30	-23.41	225 – 329 AD 138 – 340 AD	(68.2%) (95.4%)
DEM – 2221	(2011), Sector B, Sq. N8, # 008	Charcoal	626 ± 25	-24.35	1298 – 1391 AD 1290 – 1398 AD	(68.2%) (95.4%)

and well preserved pottery fragments were collected and a small test-trench was excavated in order to identify if these sherds were moved by erosion from the main chamber or were placed here deliberately. Then, Chamber B has been divided in two areas. The area close to the passage (Upper), where pottery fragments were covered by a thin stalagmite crust, and the rear area (Lower) where the main pottery fragments were recorded.

Consequently, the upper part has been further divided in two "parts" – Upper part 1 and Upper part 2. Upper part 1 was covered by a dark gray sediment, which was overlaying a thick flowstone crust. Large pottery fragments have been collected from the sediment. Pottery fragments covered by the flowstone have been left in situ.

Upper part 2, covered with a thin flowstone, did not yield large surface pottery fragments. In this area a small test trench (1×1 m) was excavated; a sediment 2–6 cm thick, rich in charcoal and pottery, was found under the flowstone. Most of the potsherds were badly preserved due to the poorly fired fabrics.

Most of well-preserved surface LM/LH pottery have been found in the lower part of Chamber B, where excavation was not conducted. Since this pottery was to a great extent found in situ, with only limited bioturbation evidence and away from the passage, it seems that it was placed there intentionally.

Radiocarbon dating (by. Y. Maniatis)

Three charcoal samples from two different sectors of the cave were dated at the Laboratory of Archaeometry, NCSR "Demokritos", Greece, using the Gas Proportional Counters (GPC) technique.

The sample preparation and measurement procedures followed by the laboratory are described in various publications.[26] The radiocarbon dates (Table 3) are given as well as the $\delta^{13}C$ concentration measured in a mass spectrometer and used for the correction of the C14 results. The calibration of the radiocarbon dates was performed with the program OxCal v. using the 2013 dataset.[27] The calibrated dates are also given for 1σ (68.2%) and 2σ (94.5%) probability ranges. The dates represent three different periods, with a range between Classical/Hellenistic and Late Byzantine/Venetian period.

The material evidence: LBA pottery
(by V. Milidaki)

The following selected catalogue includes Bronze Age material from deposits uncovered in Chamber A (Sectors A and B) and Chamber B. The total ceramic assemblage lists about 2500 pottery fragments. According to the spatial distribution, approximately 948 fragments are from Sector A and 1354 fragments from Sector B, in Chamber A (Table 4), 71 sherds came from Chamber B and 83 from the immediate surroundings of the cave. Most fragments come from locally made vessels (coarse and plain wares); fine wares represent only a very small percentage of the assemblage. Complete profiles of vases are very rare, a vast majority of sherds are too small to allow for an identification of vessel shapes.

[26] MANIATIS and PAPADOPOULOS 2011; MANIATIS and ZIOTA 2011. For the general aspects of calculation and corrections, see MOOK and STREURMAN 1983; OLSSON 1979.

[27] REIMER et al 2013.

Chamber B

A. Fine fabrics

1. (**2233**): deep bowl FS 284, Group A (Fig. 9.1).

Fragment of semi-globular body, flaring rim, horizontal handle of round section, set just above the belly; fine brown clay; buff slip. Monochrome, brownish-red interior; wide (ca. 2 cm) band over the rim; narrow second band on the body; stripe across the handle. Decoration: multiple arcs. D. (rim): ca. 13 cm; H. (pres.): 10 cm. Early LH IIIC.

2. (**603**): deep bowl FS 284, plain (Fig. 9.2).

Fragment of semi-globular body, rim, and handle; flaring rim; horizontal handle of round section; brown clay with inclusions, burnished at the interior and the exterior. H. (pres.): 10 cm; D. (rim): ca. 15 cm. LH IIIB – early LH IIIC.

3. (**2176**): deep bowl FS 284, Group A (Fig. 9.3)

Fragment of semi-globular body, rim, and handle; flaring rim; horizontal handle of round section, set just above the belly; fine buff clay, same slip; wheel marks inside; monochrome (painted with black/brown paint) interior; wide band over the rim (ca. 2 cm); second band round the belly; big stripe across the handle. Decoration with black fugitive paint: wavy line (FM 53). D. (rim): ca. 16 cm. LH IIIB – early LH IIIC.

4. (**2208, 2210**): deep bowl FS 284 (Fig. 9.4)

2208: rim and body fragments; fine buff clay, same slip; monochrome (brown) interior; brown to red brown paint; broad band over the lip (2 cm). H. (pres.): 2.8 cm.

2210: body fragment; fine buff clay, buff slip; horizontal black/brown band. H. (pres.): 5.5 cm.

5. (2219)*:* deep bowl FS 284 (Fig. 9.5)

Part of a plain and undecorated bowl, burnished inside and outside; brown clay with inclusions; flaring rim; semi globular shape; ring base; horizontal handle of round section; traces of wheel in the interior and the base. D. (base): 6.5 cm. LH IIIB – early LH IIIC.

6. (**2234**): beaked jug FS 141 (Fig. 12.7)

Neck, shoulder and spout fragment; short concave neck with a ridge at the base; brown hard clay, with light brown core, buff slip; lustrous red/brown paint (interior of the spout painted too). Decoration: FM 31, sponge pattern (reserved rosettes) on neck, row of foliate (?) band on shoulder. LM IB/ LH II A.

Table 4. Chamber A: chronological range of pottery shapes in their stratigraphical context.

Chamber A/ Sector A		*Layer*
LMI IB/ LH IIA	# 008 (N18–19)	4
	# 012	5
	# 015 (N18–19)	5
	# 017 (N18–19)	5
	# 019	pit
	# 021	pit
Chamber A/ Sector A		*Layer*
LH IIIB/C	# 008 (N18–19)	4
	# 011 (N18–19)	4
	# 018	pit
	# 019	pit
	# 21	pit
Chamber A / Sector B		*Layer*
LM IB/LH IIA	# 005	3
	# 002	2
	# 010	pit
	# 010	6
	# 015	6
Chamber A / Sector B		*Layer*
LH IIIB/C	# 001	1
	# 007	4
	# 009	5

7. (**2218**): piriform jar or jug (Fig. 12.6).

Lower part of the body; fine light brown clay, buff slip. Decoration: black fugitive paint; main curvilinear motif. Wheel marks at the interior. LM IB/ IIA.

8 (**2231**): beaked jug (Fig. 12.8)

Fragments of neck, spout, shoulder and handle; restored from two sherds; joining with 2229 and 2230 (body sherds); concave neck ending in a beaked spout; low ridge at the bottom of the neck; vertical handle of round section; fine light brown clay, buff slip. Decoration arranged in registers; FM 64 foliate band with dot at the base of the neck; rock pattern and marine style decoration on the body; the spout and the handle are covered with black fugitive paint; two rows of horizontal bands on the lower part of the neck. Local LM IB/ IIA.

B. Coarse fabrics

9. (**2214**): pithoid vessel, base (Fig. 9.9)

Ring concave base. Orange/grey gritty micaceous clay. D.: 15 cm.

10. (**2189**): closed vessel, coarse ware (Fig. 9.10)

Body fragment; brown coarse and gritty micaceous clay. Decoration: relief band decoration with diagonal

grooves and horizontal bands with relief rope decoration on the upper part of the vessel. Local ware. H. (pres.): 11 cm.

11. (**2239**): closed vessel (Fig. 9.11)
Body fragment; coarse fabric, red micaceous clay with inclusions. Decoration: horizontal ridges. Local ware.

12. (**2411**): closed storage vessel (Fig. 9.12)
Body fragment; orange micaceous clay with grey core. Relief decoration. H. (pres.): 6 cm.

Chamber A/ Sector A

A. Fine fabrics

13. (**122, 136, 148, 305, 341, 396, 476**): deep bowl FS 284, Group A (Fig. 10.1)
Rim and body fragments; fine buff clay; buff slip; semi globular body; straight, light everted rim; two narrow exterior rim bands; third band below the narrow decorative zone; interior band below the rim. Decoration with red/brown to black paint; hasty zigzag band (second band w. 1 cm; lower band w. 0.9 cm). Early LH IIIC.

14. (**176, 225, 421, 1074**): deep bowl FS 284, Group A (Fig. 10.2)
Rim, body and base fragments; semi globular body, straight, everted rim, discoid base; medium rim band; band around the base; fine buff clay, buff-greenish slip; painted with black fugitive paint. Decoration: FM 53, wavy line; monochrome interior. Early LH IIIC.

15. (**501**): semi-globular cup FS 211 (Fig. 10.3)
Rim and body fragment; deep semi globular shape, tall everted rim; fine hard, brown clay, buff slip. Decoration with black paint: FM 48, quirks on the rim, two rows of horizontal bands below; monochrome interior. H. (pres.): 2.1 cm. LM IB/IIA (imported?).

16. (**1073**): jug (Fig. 10.4)
Body fragment. Clay fine orange, red/brown paint. Decoration: Marine Style FM 22, argonaut, type B. LM IB/IIA.

17. (**1069**): jug (Fig. 10.5)
Body fragment; fine clay; hard orange, buff slip, lustrous brown paint. Decoration: foliate band with dot; probably from the shoulder of the vase. H. (pres.): 5.3 cm. LM IB (imported?).

18. (**1066**): fragment of the body of a closed vessel (squat jug?) (Fig. 10.6)
Fine buff clay; buff slip. Decoration with black paint: traces of curvilinear motif on the body. H. (pres.): 6.6 cm.

19. (**343**): fragment of the body of a closed vessel, near the base (Fig. 10.7)
Light brown clay; buff slip; painted with black paint. Decoration: arcades. H. (pres.): 6.2 cm. LM IB/ LH IIA.

B. Coarse Fabrics

20. (**582, 587, 589**): amphora or hydria (Fig. 10.8)
Rounded flattened lip; vertical cylindrical handle of round section from rim to body; brown clay with inclusions; black slip; light on dark decoration; white diagonal bands on the upper side of the handle; local.

21. (**793, 1009**): cooking pot (Fig. 10.9)
Fragments of the rim and body of a domestic vessel; spreading rim that forms small spout; brown micaceous clay. H. (pres.): 4.8 cm.

22. (**1092, 1108**): cooking pot (Fig. 10.10)
Rim and body fragments of a cooking pot; gritty brown clay, with traces of burning at the interior and the exterior; horizontal rim; small hollow below the rim; ovoid(?) body. H. (pres.): 6.1 cm. D. (rim): ca. 20 cm.

Chamber A/ Sector B

A. Fine fabrics

29. (**1652**): semi-globular cup, FS 211. (Fig. 10.11)
Rim and body fragments; tall everted rim; Light brown clay, buff slip; Monochrome interior with black/ brown paint. Decoration: dots on the rim, two rows of horizontal bands below, tongued and undiagnosed pattern. H. (pres.): 2.9 cm. LM IB/ LH IIA.

30. (**1351**): semi-globular cup (Fig. 10.12)
Rim and body fragment; everted rim; beginnings of strap handle; pinkish clay, brown to red/brown slip in the interior and the exterior of the cup. H. (pres.): 4.2 cm. LM IB.

31. (**1532, 1974, 2067**): semi-globular cup (Fig. 10.13)
Three joining fragments of rim and body; everted rim; Fine light brown clay; buff slip; painted with brown/red fugitive paint. Decoration: chevrons below the rim, two horizontal bands; red/brown paint in the interior of the cup. H. (pres.): 3.6 cm. LM IB.

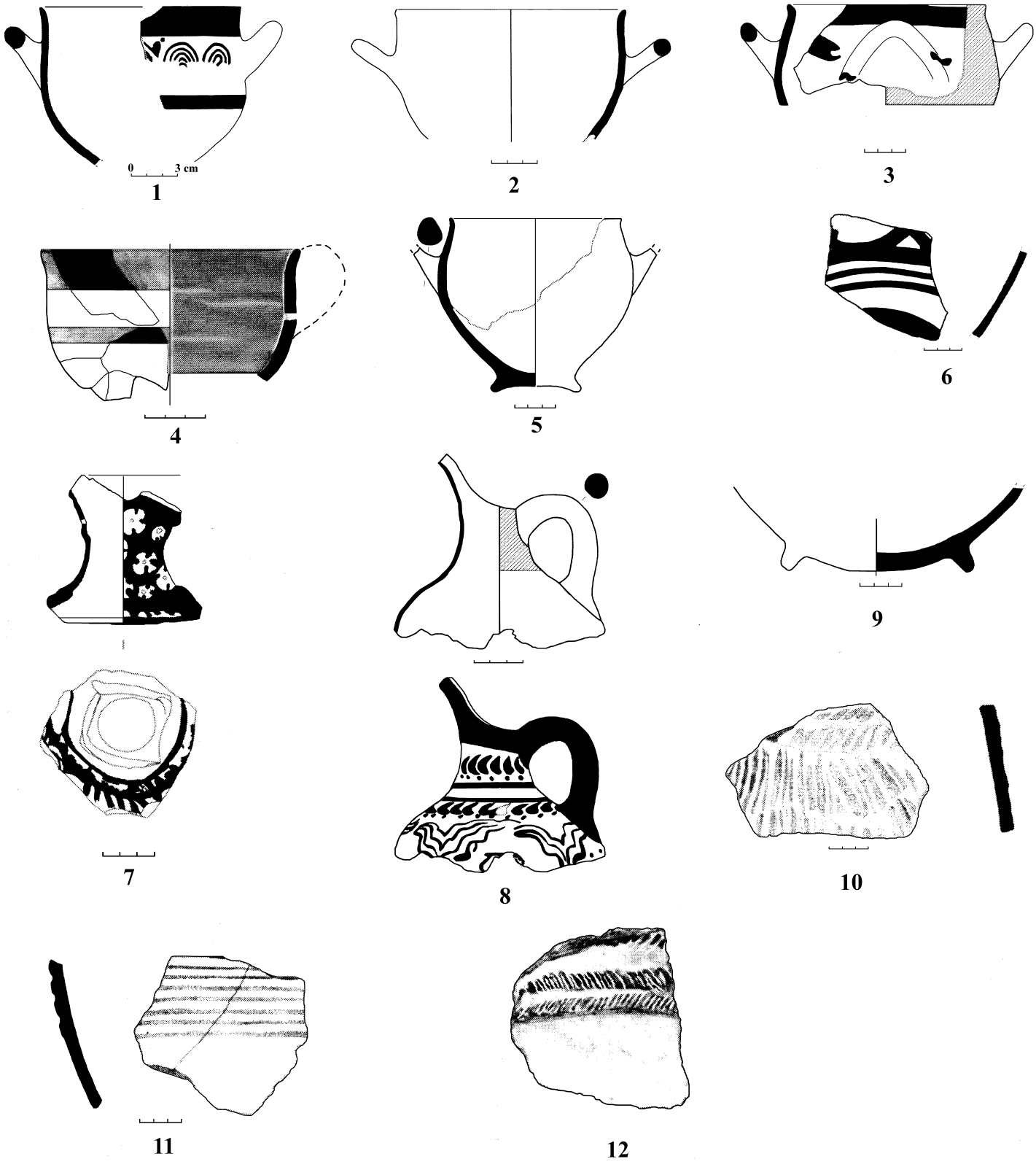

Fig. 9. Pottery. 1: 2233; 2: 603; 3: 2176; 4: 2208 and 2210; 5: 2219; 6: 2218; 7: 2234; 8: 2231; 9: 2214; 10: 2189; 11: 2239; 12: 2411. Drawings by N. Deilaki and V. Milidaki

32. (**1976**): semi-globular cup (Fig. 10.14)

Rim and body fragment; fine buff clay; buff slip; everted rim; monochrome interior, painted with black/brown fugitive paint; traces of wheel marks. Decoration: two horizontal stripes of black paint. H. (pres.): 4.4 cm.

33. (**1322**): carinated cup (Fig. 10.15)

Rim and body fragment; straight rim; fine buff clay; monochrome interior and exterior with brown paint; wheel marks; joined with 1323 (rim fragment). H. (pres.): 2.9 cm.

34. (**2025**): conical cup (Fig. 10.16)

Rim and body fragments; straight rim; brown clay; small nipple under the rim; mended from two sherds. Wheel made (in the interior of the vase the wheel traces are visible).

35. (**2429**): jug or amphora (Fig. 10.17)

Fragment of a lower part of a vessel; fine brown clay; buff slip; black to brown paint. Decoration: FM 66 arcade pattern. Same pattern as 2554. H. (pres.) : 6.4 cm. LM IB.

36. (**2554**): Jug (Fig. 10.18)

Lower part of a closed vase (jug?); pale buff slip, pale buff clay; black paint. Decoration: arcade pattern (FM 66). H. (pres.): 0.5 cm.

37. (**2426**): Beaked jug (Fig. 10.19)

Fragment of a body, shoulder and lower handle end of a closed vessel; fine buff, pinkish clay, buff slip; reddish brown paint; dotted foliate band on the neck, below it a sea urchin.

38. (**2421 and 2422**): Jug **(**Fig 11.1)

Body sherd perhaps from the same vessel as 2426; fine buff clay, same slip. Decoration: Marine Style.

39. (**2065**): Beaked jug (Fig. 11.2)

Shoulder, neck and spout fragment; small ridge on the bottom of the neck; fine, light brown clay, buff slip; black paint. Decoration: tongue pattern on the neck (FM 38), FM 53 serpentine loop on the shoulder. LM IB.

40. (**2552**): Close shape vessel (Fig. 11.3)

Buff clay, buff slip; black paint. Decoration: hatched loop.

41. (**1685**, **1611, 1364**): Close shape vessel (Fig. 11.4)

Base and body fragment; flat base; fine buff clay; black mat paint. Decoration: horizontal hasty band at the lower part of the body, indeterminate curvilinear decorative theme.

42. (**1315**): stirrup jar (?) (Fig. 11.5)

Body fragment; orange/brown clay with grey core; grey slip; wheel marks on the interior walls; ridge on the base of the handle; pendent leaves with large dots; two rows of dots (6.2×7); foliate band on the shoulder. LM IB.

43. (**1494**–**1499**): alabastron (?) (Fig. 11.6)

Rim and neck fragments of a closed miniature vessel; mended from two sherds; hard fine brown clay; metallic lustrous black paint on the interior and the exterior; everted rim, narrow biconcave neck, spherical body. H. (pres.): 3.6 cm. D. (rim): 2.8 cm.

44. (**1511**): deep bowl FS 284, Group A (Fig. 11.7)

Fine buff clay fine buff, same slip; flaring rim, hemispherical body; band on the rim; monochrome interior with brown to red/brown paint; traces of wheel in the interior. Decoration: horizontal wavy band, carelessly drawn on the upper part of the body (belly). D. (rim): 18 cm. H. (pres.): 6 cm. Early LH IIIC.

45. (**695**, **723, 1314**): deep bowl FS 284 (Fig. 11.8)

Body and handle fragments; fine, buff clay; traces of brown paint; monochrome inside; traces of a band below the handle.

46. (**6811**–**727**): fragment of the body of a deep bowl FS 284 (Fig. 11.9)

Fine, buff clay. Decoration: group of three horizontal bands of brown paint and brown curvilinear motif.

47. (**2066**–**2072**): Rim and body fragments of a goblet or alabastron (Fig. 11.10)

Flaring rim, globular body; light brown clay, buff slip; painted. Decoration with black fugitive paint; band on rim; two horizontal stripes; the main decoration motif is not preserved. Monochrome interior painted with black/brown paint. H. (pres.): 4.1 cm.

Imported Minoan (?) LM IB.

B. Coarse Fabrics

48. (**1531, 1538, 1543, 1546, 1567, 1606, 1903, 1991, 1987, 1988**): pedestalled pithos (Fig. 11.11)

Restored from 19 sherds; micaceous red clay; straight lip with small depressions; cylindrical foot with relief

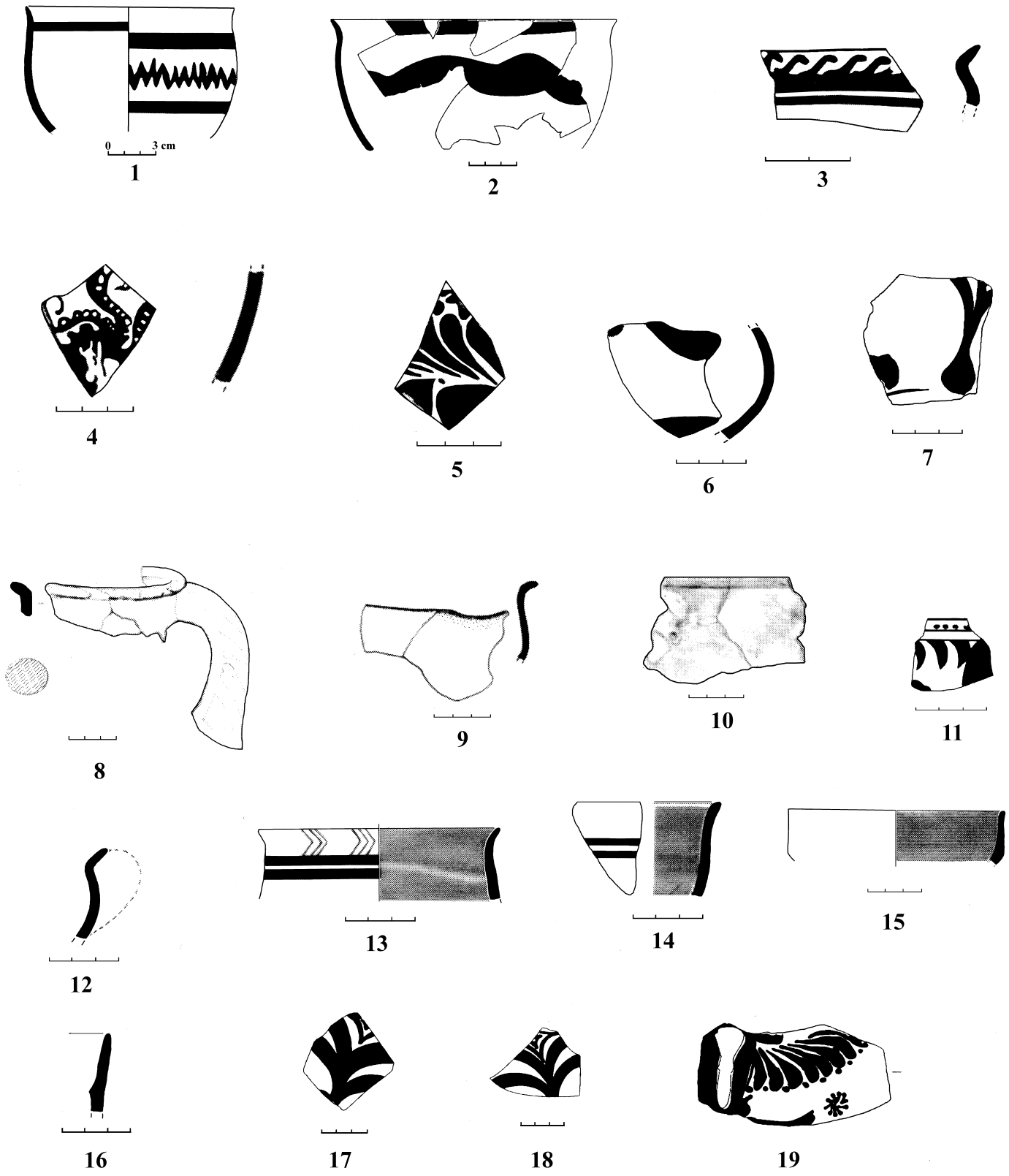

Fig. 10. Pottery. 1: 122, 136, 148, 305, 341, 396, 476; 2: 176, 225, 421, 1074; 3: 501; 4: 1073; 5: 1069; 6: 1066; 7: 343; 8: 582, 587, 589; 9: 793 and 1009; 10: 1092 and 1108; 11: 1652; 12: 1351; 13: 1532, 1974, 2067; 14: 1976; 15: 1322; 16: 2025; 17: 2429; 18: 2554; 19: 2426. Drawings by N. Deilaki, V. Milidaki, V. Trizonis and D. Bakoyiannaki

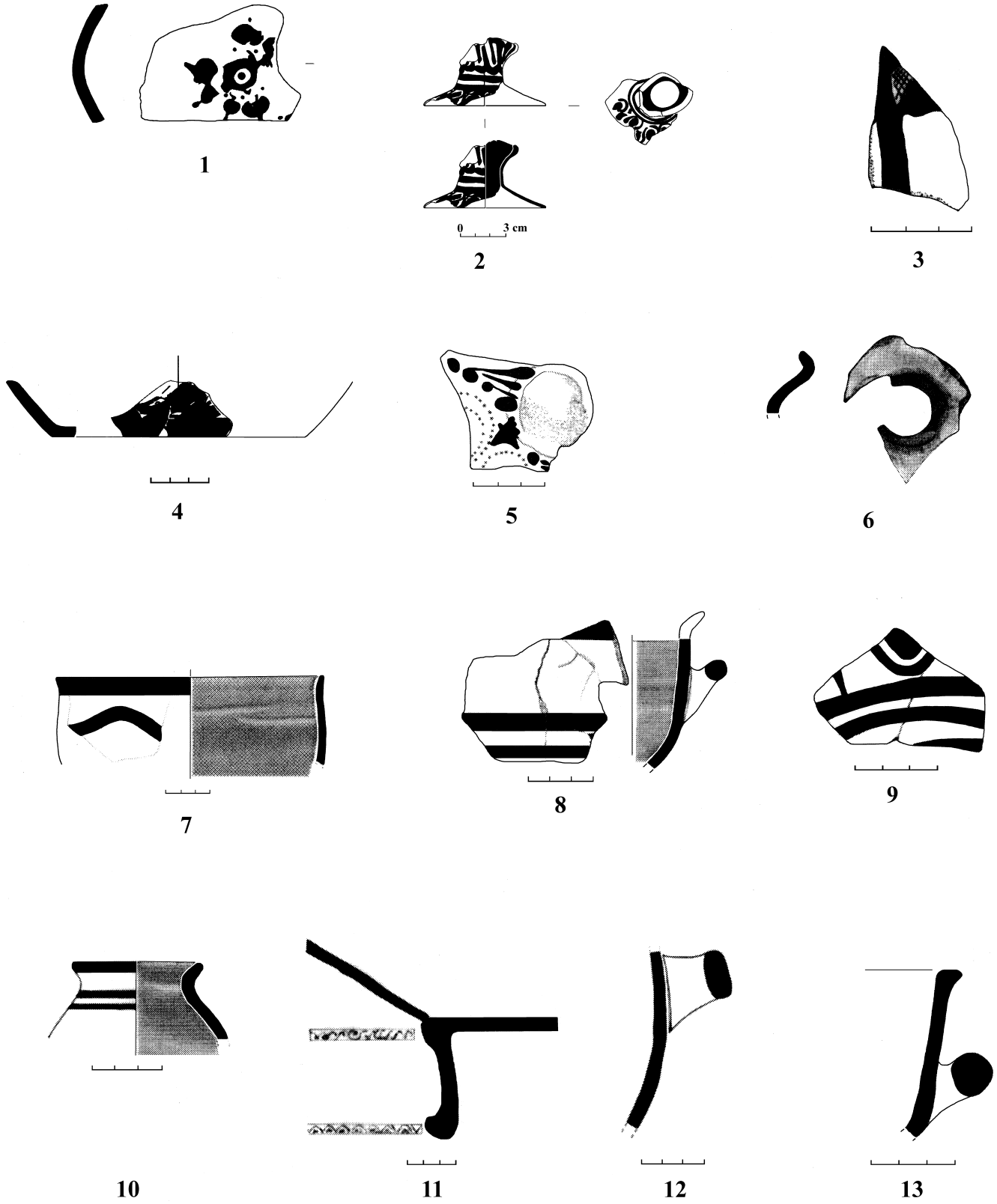

Fig. 11. Pottery. 1: 2421 and 2422; 2: 2065; 3: 2552; 4: 1685, 1611, 1364; 5: 1315; 6: 1494–1499; 7: 1511; 8: 695, 723, 1314; 9: 6811–727; 10: 2066–2072; 11: 1531, 1538, 1543, 1546, 1567, 1606, 1903, 1991, 1987, 1988; 12: 1594 and 1595; 13: 1603. Drawings by N. Deilaki and V. Milidaki

decoration at the upper and lower part; at least two small holes on the base.[28]

56. (**1594–1595**): domestic vessel (Fig. 11.12)

Fragments of body and handle of an open coarse ware vessel; red/orange micaceous gritty clay; horizontal handle of elliptical section; semi-globular shape, mended from two fragments. H. (pres.): 10.5 cm.

63. (**1603**): fragment of body, handle and rim of an open domestic vessel (Fig. 11.13)

Coarse, red/orange micaceous clay, inverted rim, horizontal handle of round section. H. (pres.): 6.3 cm.

LM IB/ LH IIA pottery

The LM IB/LH IIA pottery from the Kataphygadi Cave shows close similarities with the pottery from the settlement at Kastri, especially with deposits ν and ξ, corresponding to the late phase of the LM IB period.[29] The range of LM IB / LH IIA closed shapes comprises a jar, a bridge-spouted jar, a squat and a beaked jug, and probably a stirrup jar. Open shapes include a semi globular cup and a basin. Complete vessels have not been found.

The fine decorated sherds belong to the Marine Style and the alternating style, and a few to the Arcade group. The macroscopic fabric examination suggests that numerous sherds with Minoan decorative motifs have a mainland or Kytherian provenance, and should be identified as belonging to the pseudo-Minoan class. It has been suggested that pottery of the pseudo-Minoan class,[30] (such as Marine Style vases and vases of the Arcade Group) was produced in South Laconia and exported to a number of places, particularly to Ayia Irini on Kea and Phylakopi on Melos.[31] Clay analysis of samples of this group from Phylakopi, Ayia Irini and Trianda on Rhodes confirmed their mainland provenance.

Another clay group isolated macroscopically, that of the vases of the pseudo-Minoan class, dated to LM IB, has a distinctive whitish slip on buff clay. To this group belong Nos. 2429, 2554, 2231, 343; three of them belong also to the Arcade Group,[32] which comprises a group of jugs with arcades round the base, ornate decoration on the shoulder below the neck, and isolated motifs set in an open field.[33] A South Laconia or Kytherian provenance was also suggested for this group.

The beaked jug No. 2234 **(**FS 141), that probably belongs to the tall piriform type,[34] presents close similarities in fabric, surface treatment and decoration style with the jug from Kalkani tomb, Mycenae. The neck of the jug is decorated with a motif of reserved rosettes (the so-called 'sponge print' FM 31), a popular design from the repertoire of Knossian workshops,[35] and common decorative motif on the neck of closed vessels with a large spread in Mainland Greece and the Cyclades. The decoration of the beaked jug No. 2065 follows motifs of the pseudo-Minoan class of Mainland Greece. It is possible that the probable jug No. 1073 belongs to the same class, painted in the Marine Style with decoration of Argonaut Type B.[36] Vases of this class, a large number of which come from Knossos, are widespread in the Aegean, Mainland Greece (notably Argolid) and the islands of Cyclades. Clay analysis has demonstrated that this class was produced on the Mainland and exported to the Cyclades.[37]

Late LH IIIB – Early LH IIIC pottery

Deep bowls FS 284 seem to be the most common shape. All have the LH IIIC monochrome interior, an everted rim, a medium-sized rim band and a medium belly band. The zonal decoration consists of wavy (No. 2176) or zigzag bands (No. 305). The latter belongs to a bowl type with a narrow inner rim band below the lip. The deep bowl No. 2233 has a zonal decoration consisting of a row of multiple arcs, a Minoan motif.[38] Nevertheless, the profile, as well as the fabric, does not look Minoan. Deep bowls from the Kataphygadi Cave show similarities with the published pottery of transitional LH IIIB2 – early LH IIIC date from Agios Stephanos and the Menelaion.[39]

The Kataphygadi cave yielded also a distinct group of wheel made plain deep bowls with burnished surface treatment.

[28] COLDSTREAM and HUXLEY 1972, 139, pl. 37.
[29] COLDSTREAM and HUXLEY 1972.
[30] MOUNTJOY 1999, 21–22.
[31] MOUNTJOY 1999, 243.
[32] MOUNTJOY 1999, 23; BETANCOURT 2004, 295–298.
[33] MOUNTJOY 2009, 84; see BETANCOURT 2004, 295–298 for arcades on other Minoan vases.
[34] MOUNTJOY 1986, 30, fig. 27.
[35] PLATON and KARANTZALI 2003, 196, fig. 5.
[36] MOUNTJOY 1974, 177–180 for a definition of Types A and B.
[37] MOUNTJOY and al. 1978; MOUNTJOY and PONTING 2000.
[38] POPHAM 1970, 198, fig. 2:·9–10.
[39] MOUNTJOY 1999, 1, 279.

Conclusions

The pottery analysis leads to the conclusion that the Kataphygadi Cave was used during two periods in the LBA: LM IB/LH IIA and late LH IIIB – early IIIC. However, the absence of well stratified deposits does not allow firm conclusions concerning the specific function of the cave during each sub-period. Most of the pottery represents plain domestic vases, mainly of small and medium size, while significantly lower is the percentage of fine decorated pottery (including drinking and pouring vases). The pottery may indicate occasional or temporary use of the cave, for certain activities or practices which include the preparation and consumption of food and drink.

The lithic assemblage (by A. Papadea)

The lithic assemblage of the Kataphygadi Cave consists of six artefacts: one bladelet,[40] four tools and one debris. The tool inventory includes two distal truncations (Fig. 12.1 and 12.2) and two sickle elements with clear traces of silica gloss (Fig. 12.3 and 12.4) All lithics, except the debris, were found in chamber A. One of the truncations and the bladelet were found in Sector A, the latter in a pit filling (#022). The sickle elements and the second truncation were recorded in Sector B (West Terrace). The debris comes from the exterior of the cave.

Almost all lithic implements are fragmented. Only the mesial part of the unretouched bladelet and the distal parts of the truncations are preserved. One of the sickles is very fragmentary. The second sickle element is complete. Its length is 31 mm, its width 19.9 mm and its thickness 4.2 mm. Blades and bladelets were used as tool blanks. The truncation from Sector A and the complete sickle element are made on blades while the truncation from sector B is knapped on a bladelet. The blank of the second sickle element is non diagnostic due to fracture.

The lithic implements do not present any traces of burning or patina. The complete sickle element bears no cortex on its dorsal face. Butts are absent due to fracture or modification by retouch (complete sickle element). The complete sickle element was manufactured on a wide blade. It presents two oblique truncations and a double denticulation. The retouch of its distal truncation is inverse while the retouch of its proximal truncation is direct. The denticulate of the left side was formed by direct, regular and abrupt retouch while the one of the right side by direct, abrupt retouch. The silica gloss of the sickle element forms a thick layer on the denticulate of the left side. The second sickle element, although very fragmented, preserves part of a denticulate with silica gloss. Both sickle elements are blunt.

The type of the sickle element, which was truncated and denticulated, appears in many Bronze Age sites in Greece.[41] Although it is not an exclusively diagnostic type

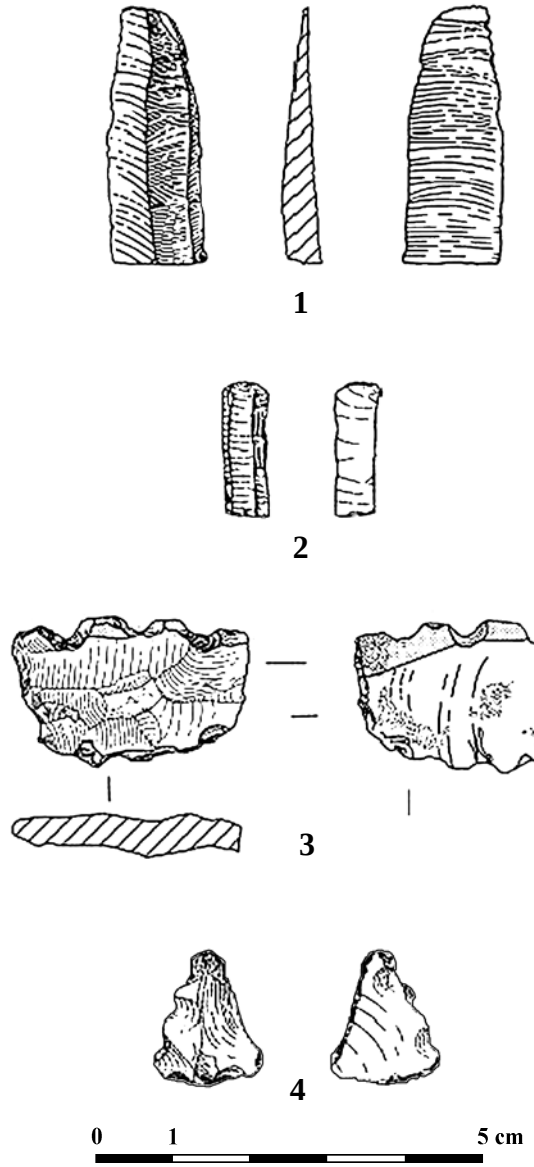

Fig. 12. Chipped stone tools

[40] For bladelets classification see ADAM 1989, 42–43. The bladelet bears a very marginal inverse retouch on its left side which ends up on an inverse retouched micro-notch. This retouch was probably created by post-depositional processes although modification by use cannot be excluded.

[41] MOUNDREA-AGRAFIOTI 1990, 401; RUNNELS 1985, 388.

for the Late Bronze Age, we cannot reject the idea that it was used during the LM IB/IIA to LH IIIB/C phases of the cave's use.

The raw materials used for the production of lithics are flint (3 examples) and obsidian (3 examples).[42] Dark brown flint was used for the manufacture of sickle elements. The debris was made on reddish flint. It is interesting to note that only the bladelets and the blade (unretouched bladelet, truncations) were made on obsidian. The origins of dark brown flint and obsidian are not known, however, the obsidian of at least two artefacts is likely to be of Melian origin. The reddish flint is of a local origin.[43]

The total absence of cores, primary debitage and technical pieces indicates that the production of the lithic artefacts did not take place in the cave. This observation, combined with the extremely small number of lithic implements and their fragmentary preservation, lead us to three different working hypotheses: a) the lithics have been moved from their original location, possibly from the exterior of the cave; b) ready blanks and tools were brought to the site in order to be used in limited, specific activities; c) the obsidian lithics found in Sector A were used as grave goods.

The sickles are related to the reaping.[44] Their presence in the cave may be linked with the cereals recorded among the archaeobotanical remains.[45] The offering of obsidian blades as grave goods is not an unknown practice in Bronze Age Greece.[46] However, since the integrity of each layer of the cave is not certain, taking into account: a) the formation of the layers, b) the disturbing C14 dates (deposits containing LM IB/LH IIA and late LH IIIB – early IIIC potsherds are dated to Hellenistic/Imperial, Byzantine/Venetian times), the hypothetical reconstruction of the exact activities in the cave is not secure.

The human skeletal remains (by Ch.-A. Zikidi)[47]

Human bones come from Sectors A and B. In Sector A (Tables 5–8) bone preservation is good, but the sample is highly fragmented, commingled and in many cases the bones are fossilized and incorporated in stalagmites and hard sediments. The assemblage consists primarily of teeth (153) (Table 7), followed by rib fragments, vertebrae, phalanges, carpals, metacarpals, tarsals, metatarsals, and a small number of long bone fragments. There were very few complete long bones or cranial fragments. This composition may imply that the observed sample comprises either 1) remains of secondary burials, namely the final stage of a practice, where longer bones have been removed for burial at a different site, or 2) a concentration of smaller bones, which have drifted in the deepest part of the cave from the overlying area.

Diagnostic elements include the innominate bones of four male individuals, two adult males (age 35–45), one sub-adult individual (age 15–20) and one young adult individual (age 20–21) (Table 8).[48] In addition, two more diagnostic elements were found – one mastoid process and a mandible of one male individual. The majority of teeth belong to younger individuals including young adults, adolescents and children as young as five years, as the assemblage contains deciduous teeth and little worn permanent tooth crowns.

The assemblage of Section B (Table 9) is highly fragmented, commingled and consists of rib fragments, metatarsals and very few long bone fragments. The sample does not include any diagnostic elements. The lack of data in this sector does not allow to draw any further conclusions regarding the sex or the age of the individuals.

42 Dr V. Giannopoulos, geologist, personal communication.

43 Dr G. Lazaridis and dr V. Giannopoulos, personal communication.

44 MOUNDREA-AGRAFIOTI 1990, 401, PAPOULIA and CHRIAZOMENOU 2013, 357.

45 KOTZAMANI this article.

46 See for example CARTER 2010.

47 The author would like to thank Dr. Anastasia Papathanassiou for supervising her study.

48 BUIKSTRA and UBELAKER 1994.

Table 5. Deposit of disarticulated human bones. Sector A. Number of Identified Specimens.

Anatomical Part	*Unit 01*	*Unit 02*	*Unit 07*	*Unit 11*	*Unit 15*	*Unit 16*	*Unit 17*	*Unit 18*	*Unit 19*
Cranium/Mandible	-	-	10	1	-	-	9	-	-
Vertebra	-	1	9	-	-	-	1	-	1
Clavicle	-	-	1	-	-	-	-	-	-
Sternum	1	-	-	-	-	-	-	-	-
Scapula	-	-	-	-	-	-	-	-	-
Rib	1	-	21	-	-	-	14	-	-
Humerus	-	-	2	-	-	-	3	-	-
Radius	1	-	1	-	-	-	-	-	1
Ulna	1	2		-	-	-	1	-	-
Carpal	-	-	2	-	-	-	1	-	-
Metacarpal	1	-	8	-	-	-	1	-	-
Hand phalanx	1	-	3	-	2	-	1	-	1
Pelvis	-	-	-	-	-	-		-	-
Femur	-	1	1	-	-	1	1	-	-
Patella	-	-	2	-	-	-		-	-
Tibia	-	3	5	-	-	-	1	-	-
Fibula	-	-	1	-	-	-	2	-	-
Tarsal	-	-	1	-	-	-	-	-	-
Metatarsal	-	2	3	-	-	1	1	-	-
Foot phalanx	-	-	3	-	-	-	2	1	-
TOTAL	**6**	**9**	**73**	**1**	**2**	**2**	**38**	**1**	**3**

Table 6. Deposit of disarticulated human bones. Sector A. Number of Identified Specimens.

Anatomical Part	*Unit 21*	*Unit 21–22*	*Unit 22*	*Unit 23*	*Unit 24*	*Unit 26*	*Unit 27*	*Sector A*
Cranium/Mandible	-	2	3	5	4	1	-	1
Vertebra	2	21	25	10	6	30	-	10
Clavicle	-	1	1	1	1	-	-	-
Sternum	-	-	-	-	-	1	-	4
Scapula	-	5	-	-	1	-	2	1
Rib	-	4	93	2	107	22	20	31
Humerus	-	1	3	-	-	1	1	7
Radius	1	1	1	-	3	-	-	6
Ulna	-	2	2	-	1	-	-	4
Carpal	1	5	1	4	4	7		-
Metacarpal	1	15	7	4	6	8	5	1
Hand phalanx	-	5	5	10	1	14	7	2
Pelvis	-	-	-	-	-	-	1	8
Femur	-	-	4	13	4	7	1	5
Patella	-	1	2	1	1	3	-	2
Tibia	-	10	3	3	3	5	-	-
Fibula	-	1	3		3	1	5	-
Tarsal	1	2	1	2	3	2	2	-
Metatarsal	1	9	-	11	-	14	2	5
Foot phalanx	3	5	-	5	3	9	4	2
TOTAL	**10**	**90**	**154**	**71**	**151**	**125**	**50**	**89**

Table 7. Sector A. Number of teeth per unit.

	Anatomical Part	*Unit 07*	*Unit 08*	*Unit 16*	*Unit 17*	*Unit 18–19*	*Unit 19*	*Unit 21*	*Unit 21–22*	*Unit 22*	*Unit 22–23*	*Unit 23*	*Unit 24*	*Unit 26*	*Unit 27*
Maxill	Deciduous Incisor 1											1		1	1
	Deciduous Incisor 2							1			1		1	1	1
	Deciduous Canine 1	1													
	Deciduous Molar 1			1		1		2							
	Deciduous Molar 2			1			1	1							
	Incisor 1	1		1				1	1		1	1		1	1
	Incisor 2							1			1		1	2	2
	Canine 1	1										1		2	1
	Premolar 3	2		1				1			2		2	2	
	Premolar 4	2		2				1			1	1	1	3	
	Molar 1	1			1									1	
	Molar 2											1		1	
	Molar 3	2			1			2					2		
Mandible	Deciduous Incisor 1	1				1		1		1		2	1		
	Deciduous Incisor 2	1						1				1	2		
	Deciduous Canine 1					1									
	Deciduous Molar 1			1								1	1		
	Deciduous Molar 2	1		1		1		1		2			1	1	
	Incisor 1	1			2			1	1		1	1	2	2	
	Incisor 2				1			2			1			2	
	Canine 1							1					1	1	
	Premolar 3	5						1			1	1	4	2	
	Premolar 4	1		1	1			1			1			3	
	Molar 1	1			1								1		
	Molar 2		1								2		3		
	Molar 3						2			1	3		3		
TOTAL		**21**	**1**	**9**	**7**	**4**	**3**	**19**	**2**	**4**	**15**	**11**	**26**	**25**	**6**

Table 8. Deposit of disarticulated human bones. Sector A. Sex estimation and Minimum Number of Individuals (5?) based on post-cranial fragments

Anatomical part	*Number of fragments*	*Side*			*Sex*	
		R	*L*	*N. A.*	*M*	*F*
Cranium/Mandible	36	1	1	34	1	-
Vertebra	116	-	-	116	-	-
Clavicle	6	2	3	1	-	-
Sternum	6	-	-	6	-	-
Scapula	9	4	3	2	-	-
Rib	315	82	76	157	-	-
Humerus, proximal epiphysis	5	2	4	-	-	-
Humerus, diaphysis	4	-	-	4	-	-
Humerus, distal epiphysis	9	8	1	-	-	-
Radius, proximal epiphysis	6	2	4	-	-	-
Radius, diaphysis	1	-	-	1	-	-
Radius, distal epiphysis	8	3	5	-	-	-
Ulna, proximal epiphysis	5	3	2	-	-	-
Ulna, distal epiphysis	8	2	4	2	-	-
Carpal	25	16	8	1	-	-
Metacarpal	57	25	26	6	-	-
Hand phalanx	52	26	22	4	-	-
Pelvis	9	3	5	1	5	-
Femur, proximal epiphysis	18	8	9	1	-	-
Femur, diaphysis	4	1	-	3	-	-
Femur, distal epiphysis	16	6	9	1	-	-
Patella	12	5	5	2	-	-
Tibia, proximal epiphysis	8	3	3	2	-	-
Tibia, diaphysis	10	-	-	10	-	-
Tibia, distal epiphysis	15	4	3	8	-	-
Fibula, proximal epiphysis	3	-	3	-	-	-
Fibula, diaphysis	5	-	-	5	-	-
Fibula, distal epiphysis	8	2	5	1	-	-
Tarsal	14	5	6	3	-	-
Metatarsal	49	24	18	7	-	-
Foot phalanx	36	16	14	6	-	-
TOTAL	**875**	**252**	**236**	**386**	**5**	-

Table 9. Chamber A. Sector B. Disarticulated human bones.

Anatomical Part	*Number of fragments*	*Side*		
		R	*L*	*N.A.*
Cranium/Mandible	-	-	-	-
Vertebra	-	-	-	-
Clavicle	-	-	-	-
Sternum	-	-	-	-
Scapula	-	-	-	-
Rib	10	-	-	10
Humerus, distal epiphysis	2	2	-	-
Radius	-	-	-	-
Ulna	-	-	-	-
Carpal	-	-	-	-
Metacarpal	-	-	-	-
Hand phalanx	-	-	-	-
Pelvis	-	-	-	-
Femur, distal epiphysis	1	-	1	-
Patella	-	-	-	-
Tibia	-	-	-	-
Fibula	-	-	-	-
Tarsal	-	-	-	-
Metatarsal	2	-	2	-
Foot phalanx	-	-	-	-
TOTAL	**15**	**2**	**3**	**10**

The archaeobotanical remains (by G. Kotzamani)

During the 2011 fieldwork season, a systematic soil sampling strategy was designed and implemented, ending with the collection of 84 samples from all types of deposits excavated in Sectors A and B (i.e. pits, pyres, an area with bones, an area with stone arrangements, etc.). The volume of each sample was dictated by the dimensions of the excavated unit, aiming to collect at least 40 litres of sediments when possible. All samples were initially dry-sieved and then processed with a modified version of a York style flotation machine,[49] using brass sieves with 1 mm and 0.3 mm apertures for the coarse and fine organic material (flots) respectively. A plastic mesh with 1 mm aperture was utilized during flotation for the retention of the heavier fraction (residue). An attempt was made to identify all plants to species level but in many instances poor preservation allowed their assignment to only a more general Genus or Family category. Nomenclature follows Flora Europaea.[50] Quantification was carried out on the basis of the Minimum Number of characteristic plant parts (MNI).

The archaeobotanical assemblage of Kataphygadi is poor and contains both carbonized and mineralized remains in a generally low state of preservation. Forty four out of the eighty four samples rendered some archaeobotanical material with only two samples counting more than 50 identifiable and quantifiable items. The majority of samples (30) contain less than 10 preserved plant items. The total sum of archaeobotanical finds in all samples is 466 (267 in Sector A and 199 in Sector B). The range of species encountered in the Kataphygadi archaeobotanical set contains plant representatives of cereals, pulses, wild fruits and nuts as well as elements of the wild flora (Table 10).

[49] FRENCH 1971.

[50] TUTIN *et al*. 1964–1993.

Table 10. Overview of the plant species present in the Kataphygadi cave archaeobotanical assemblage

	Sector A		*Sector B*	
	Sum	*Count*	*Sum*	*Count*
CEREALS				
Triticum monococcum grains	2	1	3	1
Triticum dicoccum grains	3	2	22	4
Triticum monococcum/dicoccum grains	3	2	2	1
Triticum aestivum/durum grains	0	0	6	3
Triticum sp. grains	2	1	0	0
Triticum/Hordeum sp. grains	20	12	25	7
Hordeum vulgare grains	14	7	5	3
Cerealia grains	2	2	0	0
PULSES				
Lens culinaris seeds	1	1	4	3
Vicia ervilia seeds	2	1	5	4
Vicia faba seeds	23	9	7	6
Vicia/Lathyrus sp. seeds	16	9	13	7
Lathyrus cicera/sativus seeds	1	1	3	1
Pisum sativum seeds	1	1	2	2
Large legume indet. seeds	2	2	2	1
Small legume indet. seeds	11	8	4	3
Legume indet. seeds	9	7	9	8
FRUITS/NUTS				
Ficus carica seeds	145	15	58	13
Ficus carica fruit fragments	+	7	+	2
Vitis vinifera pips	0	0	2	2
Olea europaea stones	1	1	7	4
Prunus sp. seeds	1	1	0	0
Fruit/Nut indet. seeds	2	2	2	2
WILD FLORA				
CRUCIFEREAE seeds	0	0	1	1
COMPOSITAE seeds	0	0	2	2
Galium/Asperula sp. seeds	0	0	2	2
Linum sp. seeds	0	0	1	1
Lolium temulentum seeds	0	0	4	3
GRAMINAE small seeds	1	1	3	3
GRAMINAE seeds	0	0	4	4
Carex sp. seeds	2	2	0	0
Wild indet. seeds	3	3	2	2
TOTAL	**267**	**22**	**199**	**21**

The category of cereals includes caryopses of the glume wheat species einkorn (*Triticum monococcum*) and emmer (*Triticum dicoccum*) and of free-threshing wheat (of the teraploid *Triticum durum* or the hexaploid *Triticum aestivum* type) as well as grains of barley (*Hordeum vulgare*). The preservation status of cereals is often extremely limited allowing only for a very general identification of the finds as grains of wheat/barley (*Triticum/Hordeum* sp.). No chaff finds were identified among the archaeobotanical remains.

The group of pulses exhibits a striking variety of plant species. At least five different legume species were identified, namely broad bean (*Vicia faba*), bitter vetch (*Vicia ervilia*), lentil (*Lens culinaris*), grass pea (*Lathyrus cicera/sativus*) and common pea (*Pisum sativum*); broad bean shows repeated occurrence. The high degree of fragmentation posed a restricting parameter in species determination, so that many of the finds were accommodated in an intermediate taxonomic category assigned as *Vicia/Lathyrus* sp.

Fig (*Ficus carica*) is the main plant element observed among the fruits. It appears mainly in the form of carbonized and mineralized seeds, but occasionally parts of carbonized fruits with seeds attached on the flesh have been identified. Grape (*Vitis vinifera*) and olive (*Olea europaea*) are also recorded, but their overall presence is very restricted (less than 10 counted individuals in each case). A unique seed fragment, belonging to some species of the genus *Prunus* sp., complements the spectrum of fruit/nut taxa in the assemblage.

Finally, a limited range of wild plants was also identified among the archaeobotanical macroremains, providing some scanty evidence of vegetation in the area surrounding the cave. Most of them were only attributed to family level, due to their poor state of preservation (Graminae, Cruciferae, Compositeae). In some cases, however, we were able to identify the genus or species level. A single seed identified as flax (*Linum* sp.) derives probably from wild plants of the species *L. bienne* growing in the region. Wild flax's distribution is rather wide, covering the whole geographic space of western Europe, the Mediterranean basin, northern Africa, the Middle East, Iran and the Caucasus area, where it mostly thrives in wet habitats such as moist grassy areas, springs, seepage areas on rocky slopes, moist clay soils and marshy lands.[51]

When examined from a spatial perspective, no major qualitative or quantitative differences can be observed between the samples from Sectors A and B. The archaeobotanical remains are generally few across the whole excavated space while the range of species encountered in both sectors does not diverge significantly (absence of free threshing wheat and grape from Sector A and more restricted variety of wild plants in the same area). Moreover, the coexistence of LM ceramic finds with charcoal fragments dated through C14 to the Hellenistic/Imperial and Byzantine/Venetian times, raises suspicions over the occurrence of serious disordering and admixture events concerning the cave's deposits. Therefore, any attempt for accurate contextual analysis of the highly susceptible – in terms of stratigraphic accuracy – botanical material is to a great extent arbitrary. No specific associations can be ventured, for example, between the human bones' accumulation in layer 5 of Sector A and the few botanical finds recovered around them, aiming to interpret probable use of plants in mortuary behaviour.

The overall paucity and mixed nature of the Kataphygadi archaeobotanical samples do not favour any interpretative suggestions over the use of the cave as a storage space. Instead, the plant remains encountered in both excavated sectors most probably constitute the remnants or spillages of plant material utilized in a variety of activities performed by the successive users of the cave (i.e. cooking, food processing and consumption, handicraft elaboration involving the utilization of plants, fuel uses etc.). Besides, some introduction of seeds and fruits of the surrounding vegetation through natural depositional processes (i.e. wind, water or animal action), as observed in many Mediterranean caves and rock shelters, cannot be excluded.[52] Through such activities varietal plant material of different origin would gradually accumulate and become incorporated in the cave's deposits over the time, ultimately configuring a pattern of random and uneven distribution. Thus, the increased amounts of seeds (>50), in comparison to the rest of the archaeobotanical data set encountered in two pit samples from Sectors A and B (#019/N18–N19 and #010/N8–N9 respectively), may actually be the cumulative result of plant material concentration after successive episodes of space cleaning events.

Given that the LM IB/LH IIA to LH IIIB/C phases have been recognized as the main periods of the cave's use, the content of the Kataphygadi archaeobotanical assemblage complements other Late Bronze Age relevant data recorded from northern and southern Greece. Despite the low quantities of archaeobotanical remains in Kataphygadi the variety of species are worth of a brief

[51] ZOHARY and HOPF 2000, 127.

[52] HANSEN 2001.

comparison with other contemporary plant datasets recovered across the Aegean.

Although the glume wheats einkorn and emmer (*Triticum monococcum* and *Triticum dicoccum*) are the most frequent and dominant wheat species in Greek Late Bronze Age archaeobotanical assemblages, the presence of free threshing bread/macaroni wheat (*Triticum aestivum/durum*) has been attested at many sites, testifying the progressively increasing cultivation of this cereal crop. Barley (*Hordeum vulgare*) is also a common and regular cereal component of the contemporary assemblages, while the utilization of common millet seems to have became established during this period. The range of pulse species is equally striking, highlighting the importance of diversification in the viability of prehistoric agricultural regimes. Lentils (*Lens* sp.), bitter vetch (*Vicia ervilia*), faba beans (*Vicia faba*), grass peas (*Lathyrus cicera/sativus*) and common peas (*Pisum* sp.) are the most frequent legume ingredients of the archaeobotanical assemblages, occasionally complemented by finds of chickpea (*Cicer arietinum*), Spanish vetchling (*Lathyrus clymenum*) and Cyprus vetch (*Lathyrus ochrus*). Seed remnants of the Mediterranean triad of fig (*Ficus carica*), grape (*Vitis vinifera*) and olive (*Olea europaea*) form indisputably the bulk of archaebotanical finds in the category of fruits and nuts. However, remains of acorns (*Quercus* sp.), almonds (*Prunus dulcis*), blackberries (*Rubus fruticosus*), cornelian cherries (*Cornus mas*), elderberries (*Sambucus* spp.) and strawberries (*Fragaria vesca*) are also included in several Late Bronze Age archaeobotanical assemblages from Greece, denoting the contribution of plant gathering activities in daily subsistence practices.

The microfauna assemblage
(by Katerina Papayianni)[53]

The excavations at the Kataphygadi Cave yielded a plethora of microvertebrate remains from Sectors A and B: 780 and 291 *Numbers of Identified Specimens* (NISP) respectively. In Sector A, trenches N18 and N19 produced the majority of the remains, whereas in Sector B trenches N8 and N9 produced most of the remains. Micromammals, amphibians, reptiles and small birds comprise the microfaunal record. In terms of micromammals, rodents as well as insectivores have been identified: the rat (*Rattus* sp.), the rock mouse (*Apodemus* cf. *mystacinus*), the wood/yellow-necked mouse (*Apodemus sylvaticus*/*flavicollis*), and the edible dormouse (*Glis glis*) constitute the rodent record; the hedgehog (*Erinaceus* sp.), the garden shrew (*Crocidura* cf. *suaveolens*) and a chiropteran (cf. *Myotis* sp.) constitute the insectivore record. In terms of representation, *Rattus* and *Apodemus* appear in both sectors, *Crocidura* and *Erinaceus* in Sector A, *Glis* and cf. *Myotis* in Sector B. In terms of the rest of the microvertebrates, birds have not been identified while amphibians and reptiles will be studied separately.[54] At a first glance, reptiles seem to belong to both snakes and lizards. Some of the snake vertebrae could belong to Colubridae family.

The micromammal skeletal material is probably not dated to the Bronze Age, but to later periods of the cave's use, as it seems either intrusive or accumulated by predators. The rat is a typically intrusive species, which can burrow into earlier archaeological deposits. We can assume that some of the rats found in Kataphygadi are intrusive, because 1) the genus has not archaeologically appeared in the Aegean region prior to the Roman Period,[55] and 2) some molars of rats preserve enough collagen. Similar collagen has been also noted on *Apodemus* molars. Furthermore, the majority of the *Rattus* and the *Apodemus* molars betray evidence for predation in the form of enamel loss, either severe or minor. Kataphygadi must have sheltered one or more predators, probably avian, which digested their prey in the cave and regurgitated the bones and pelt as a pellet; such regurgitated pellets could have also accumulated just outside the cave's entrance, from where they might have rolled and fallen inside. Examples of digestion can be traced on molars from both sectors. A case of burnt micromammal remains comes from a hearth/fire in Sector A, Trench M18: a lightly burnt brown coloured *Apodemus* mandible. There is also a calcined *Apodemus* mandible from the human bone area in Sector A. Lastly, there is evidence for stalagmitic crust on some molars from Sector A; a similar crust has been noted on human bones as well.

The Kataphygadi micromammal material cannot be associated with the human use of the cave. It is evident of natural agents, the predators, which used the cave after its

[53] The Kataphygadi material was studied during the academic year 2014–15 in the course of a Wiener Faunal Fellowship of the author. The author would like to thank Dr Lars Van den Hoek Ostende and Dr Petros Lymberakis of the Natural History Museums Naturalis (Leiden, the Netherlands) and Herakleion (Crete) respectively for the provision of reference skeletal material of rodents and insectivores.

[54] The amphibian and reptile remains will be studied by S. Michalopoulou.

[55] REUMER 1986; AUDOIN-ROUZEAU and VIGNE 1994.

human use probably until recently. The *Rattus*, *Apodemus* and *Crocidura* are parts of the diet of *Tyto alba*, the barn owl, as the author noticed after the collection of pellets of this bird on Crete in the summer of 2014. Furthermore, this array of species can be found in Peloponnese and Kythera island, together with *Glis*, *Erinaceus* and *Myotis*, which constitute a more rare delicacy of the predator(s) that used Kataphygadi as a roosting place. The enamel loss of some of the Kataphygadi *Rattus* and *Apodemus* molars, though, is greater than the one caused by the barn owl, so there were probably two different predators using the cave. Perhaps the second one is not a bird, but a mammal, like the marten or the fox.

To sum up, the Kataphygadi microfauna is not informative on the composition of the Bronze Age microvertebrate record of Kythera, as the predation evidence, as well as the burrowing habits, obscure a clear image.

The ungulates and leporids faunal assemblage
(by K. Trantalidou)

Surface material

The faunal fragments (in total 963) collected from the surface of the Cave's different areas include intrusive leporids,[56] razing small ruminants (that had fallen in the chasm), the backfilling pushed by the water or eventually consumed (though a few sheep[57] or goat bones bear cut marks). Several of them were encrusted. Twenty seven shells of marine gastropods (*Monodonta turbinata* and limpets) have also been uncovered in Chamber B, three in the passage between West Terrace and Chamber B and five in P9 #002. A shell of conus snail (*Conus mediterranneus*) was found in Sector A, in the layer containing human bones.[58]

Sector A

Here 8,560 fragments were found, bringing the total number of bones to 10,217. The biggest accumulation of mammals were located at the squares N, L, M and the pit,[59] at the western part of Sector A.[60]

Among the south-eastern squares #001 had 1,050 animal bones and six human skeletal fragments, #003 provided 855 animal remains (no human remains), and #011 yielded 517 animal bone fragments and one human. Among the sheep and goat bones these which represented young and sub-adults were twice as numerous as those representing adult animals.[61] The bones collected from the surface represented, on average, much younger animals. All anatomical parts of sheep and goat were identified in Sector A (Table 11). In the pit, sheep to goat bones ratio was 3 : 1. The bones recovered from this area can represent at least 18 slaughtered animals (Table 12). Cut marks are visible on three bones from units 002 (N19) and 021 (pit). The burnt bones were very rare, they have been found at L19 #002 and N19 #007. In the whole area leporid bones do not exceed twenty and no anthropogenic traces were identified on them.

Sector B

Here, 1,177 bone fragments of sheep, goat, and occasionally leporid,[62] were found. Among them were recorded a dozen burnt fragments (#002, 003), some more suid elements[63] and a donkey phalanx (uncovered in a small pit (#12) with dark grayish-brown soil, above layers 3 and 4). The setting of that terrace and its archaeological finds can indicate a different use than that of the deepest part of the cave, although this conclusion is of a tentative character only.

The recorded data and its analysis provided more questions than answers. It seems probable that the fill of the cave is the result of natural forces and some anthropogenic episodes. The surface material, as represented by the split axially vertebrae and the long bones bearing cut marks, suggests human consumption. These samples came from Western Terrace, which was relatively leveled, and from the eastern walls of the cave (J13–15). It is also

[56] In the group of the Leporidae family 26 bone fragments belonged to a whole skeleton found in Chamber B. Bone elements in Chamber B totalise 53 surface (ungulate and lagomorpha) bone fragments.

[57] The surface material identified according to species was classified in 68 sheep and 46 goat fragments. The discarded bones could be remains of at least 9 individuals of the caprinae sub-family The ratio of sheep in relation to goat bones was 1.47:1, an indication which could be linked to an earlier period.

[58] It was found at N18, layer 5, #016.

[59] Two fish vertebrae were found among the material.

[60] At Sector A, artificial horizontal layers, including several units, contained the following number of fragments: layer 1: 4,146; layer 2: 221; layer 3: 77; layer 4: 1,194.; layer 5: 1,090; pit: 665.

[61] 191 and 147 bones come from sheep and goat respectively.

[62] In the excavated sectors and the surface finds leporid bones are very sporadic. In total they do not exceed 44 fragments. At Sector B 13 lagomorpha bones were found.

[63] Pig bones totalise five fragments in both Chambers (surface collection and excavation areas included).

Table 11. Chamber A, Sector A, pit: quantitative distribution of sheep and goat remains in units 019–23

Bone element	*#019*	*#021*	*#022 (N18–19)*	*#022–23*	*#023*	*Pit*
Horn Core			2**			
Cranium	45	11	10			12
Mandible	4		2		1	
Loose Teeth	11 (3**/2*)	3	22 (2**/20*)	1		
Costae	26	16	22		1	22
Vertebrae	86	23	12	2	1	13
Scapula	3 (1*)		3 (1**)			1
Humerus	12 (4*)	2		2		1
Radius	3 (1*)	1*	1			
Ulna						
Metacarpus			1			
Innominate	2					
Femur	9	1			1	1
Patella		1				
Tibia	23 (2*/1**)	2	2	1		5
Metatarsus	2 (1**)			1		
Metapodia	2		1			1
Carpal/ Tarsal	6		5			1
Astragalus	3*		1			
Calcaneus	1**		1*			
Phalanges	6 (1*/1**)	6 (4*/1**)	5 (2*/2**)	2	1**	2 (1*)
Long Bone Fragments	24	23	20			106
TOTAL	**268**	**89**	**110**	**9**	**5**	**165**

– *sheep, ** goat.

possible to identify a sort of animal selection,[64] even thought goat and sheep are the commonest animals on the Aegean islands.[65] The fact that the consumed sheep were more numerous than goats[66] could suggest an earlier period. It has been established that the bulk of the pottery belonged to the second millennium. In Sector A, no grave goods were found in clear association with the bundle burials. However, the conus shell, the astragals, in a burnt lens and the periphery of a later disturbance (a pit), could be funeral gifts forthwith with the figs, the lithic bladetet and truncation or the vases.

[64] LEONHARD (1899, 31) reproducing scientific works of the beginning of the century, notes the presence of *Canis aureus, Mustela foina, Rhinolophus familiaris, Mus musculus* and *Mus rattus*. The presence of marten (distal end of a humerus) has been testified at Aghios Georgios sto Vouno (TRANTALIDOU 2013a, 481) in layers where the post-Byzantine pottery exceeds 50%. Its attendance has been assumed in the cave by K. Papayiannis. Bats and rats are expected in caves. Turtle-doves and quails characterized the avian fauna of the past centuries (EGMONT and HEYMAN 1759, 65; STEPHANOPOLI (1800) 1974, 83; LEAK 1835, 72).

[65] In the beginning of the 19th century GALT (1812, 140) testified that "The cattle of various kinds are computed to amount to fifteen hundreds, the sheep to two thousands and the goats to three thousands".

[66] There is an exception. At the excavated squares in Sector B the identified sheep bones were 51 versus 62 of those of the goat. At the same sector a tiny glazed sherd was found. It was the only pot fragment that did not belong to the BA period.

Table 12. Minimum number of sheep and goats estimated on the basis of the bones found in the cave

Anatomical elements	*Sector A*				*Sector B*				*Surface*				
	Right	*Left*	*MNI*		*Right*	*Left*	*MNI*		*Right*	*Left*	*Sex*	*MNI*	
M^1	7	7	7		3	1	3	3	3	4		4	4
M^{1**}	3	2	3	10									
M_1	3	1	3						1			1	
M_{1*}	4	10	10						1	4			
M_{1**}		5	5	18	4		4	4	1			1	6
M^2	5	9	9		3	1	3		1	2		2	
M^{2*}	1		1						1	1		1	3
M^{2**}	2	1	2	12	1		1	4					
M_2		1	1										
M_{2*}	2	2	2		1	1	1		1			1	
M_{2**}	1	3	3	7	1		1	2	4	2		4	5
Scapula,p					1		1	1					
Scapula,p*	2	1	2						2	3		3	
Scapula,p**		1	1	3					2			2	5
Humerus,d	4	2	4							3		3	
Humerus,d*	1	3	3		2		2			2		2	
Humerus,d**		1	1	8		1	1	3	3	1		3	8
Radius,p	1		1						3	1		3	
Radius,p*	2	2	2		1		1	1	1			1	4
Radius,p**	1		1										
Radius,d										1		1	
Radius,d*		2	2	6						1		1	2
Femur,d	7	1	7	7	1		1	1	3			3	
Femur,d*									3	1		3	
Femur,d**									3			3	9
Tibia,d		3	3		1		1		1	2		2	
Tibia,d*	2		2						1	2		2	
TIBIA,d**	1	1	1	6		1	1	2		3		3	7
Metacarpal,p	2	2	2		1		1			2		2	
Metacarpal,p*		1	1	3					2	1		2	
Metacarpal,p**					1	1	1	2		3		3	7
Metacarpal,d*									1			1	1
Metatarsal,p		1	1			1	1						
Metatarsal,p*						1	1	2					
Metatarsal,p**	2		2										
Metatarsal,d*	1		1	4					1	2		2	2
Astragalus	2_F	$2_{1F/1M}$	3			1	1			1	2_F	2	2
Astragalus*	$6_{1M/4F}$	$7_{2M/3F}$	7		2_{1F}	1	2						
Astragalus**	5_F	1_F	5	15	1	1_F	1	4					
Calcaneus									1			1	
Calcaneus*	4		4						1	1		1	
Calcaneus**	1	6	6	10	1	2	2	2	1	2		2	4

– *sheep, ** goat.

Caves as burial chambers (by K. Trantalidou)

The use of caves as burial sites is common in many parts of the world and in different human cultures since cavities were convenient places of disposal with protection against the physical elements and human disturbances. The configuration of the mortuary caves is of primary importance for the analysis of their use. The entrance to the cave on the west side of Lake Vouliagmeni at Perachora is possible through limestone boulders. The cavern, poorly suitable for habitation, contains a low passage and two chambers.[67] The mortuary cave at Hagios Charalambos,[68] in the Lasithi Plateau in Crete, consists of a vertical entrance shaft, seven small interconnected rooms with steeply inclined floors and passages. Because of the sloping floor, two walls were constructed inside Room 5, as terrace walls, to create spaces to hold the bones. Both caves (at Perachora and Hagios Charalambos) were used as "ossuaries".

The cave entrances had often been sealed with cobbles, slabs or rock piles at the time the burials were placed in them. When these stones were removed, the burials were subject to disturbance from humans and physical forces.[69] The cave at Hagios Charalambos, which was in use during EM III to MM, and especially in the MM IIB period (the deposit was put in the cavern within a short time), was totally closed by the end of LM III.

Caves were used both for individual primary burials (deposit of the whole person) and secondary interments.[70] The corporal manipulation can be recognized by the disarticulation of the skeletons and the relocation of selected parts. It involves representative or significant bone bundles interments. At the Perachora cave the bones, mixed with sherds,[71] came from 52 individuals, mainly children in their pre-teenage years.[72] Skulls were found arranged in a row along the side walls of the cave. The cave at Hagios Charalambos was also an ossuary containing ca. 11,000 bones and piles of skulls.[73] This constituted the largest preserved assemblage of bones from the Lasithi Plain and one of the largest assemblages known from Early to Middle Minoan Crete. Bones not only included all parts of the skeleton but they present people of all age groups, from infants to adults.[74]

Comments and discussion (by K. Trantalidou)

The Kataphygadi cave satisfies the criteria for a mortuary cave (spatial limits for human activity caused by fallen boulders and low ceilings, dampness, darkness, and unsuitability for habitation) as were developed in recent research.[75] A geographical location can be also included into these criteria. The cave is situated in the limestone zone beyond the margins of agricultural areas and away from habitation sites.

The repertoire of coarse and fine pottery suggests prehistoric use of the cave exclusively in the second millennium. The same conclusion can be drawn from the stone implements and the plant remains. At present, however, any spatial and stratigraphical separation is impossible between the LM IB/LH IIA and LH IIIB/early IIIC finds. Furthermore, the radiocarbon dates indicate human presence, of yet unknown character, in the Hellenistic/Imperial and Venetian periods.

No specialized equipment or votives, such as clay figurines, bronze objects, seals or jewellery, have been found in the cave, so far. On the contrary, the unearthed

67 The cave lies about 300 m from EH settlement of Perachora, and approximately 500 m from the Gulf of Corinth (KOUMOUZELIS 1996; PETROUTSA, RICHARDS and MANOLIS 2007).

68 BETANCOURT et al. 2008; 2014.

69 HUBBARD and BARBER 1997; SHAW 1996.

70 Throughout the bronze age, cavities in the rock indented for a corpse and ossuaries have been noted among the various grave types both in Crete and the Cyclades (the wider Aegean) and in the mainland. EBA ossuaries in caves or rock shelters were investigated at Mochlos island (SEAGER 1912, 13–14), at Kato Chryssolakkos/Mallia (DEMARGNE 1945, 15–24), at the Trapeza cave (PENDLEBURY and MONEY-COUTTS 1935–1936, 18–23; TYREE 1974, 10–11), Zygouries, Argive Heraeum and Dimini (FRÖDIN and PERSSON 1938, 341; CHATZIPOULIOU-KALLIRI 1983, 369). See also FAURE 1964; TOMKINS 2012.

71 Pottery fragments (247 in number), predominantly from bowls, dated to EH II and could have been broken during burial rituals (KOUMOUZELIS 1996).

72 STRAVOPODI in KOUMOUZELIS 1996; STRAVOPODI, MANOLIS, KOUSOULAKOS, ALEPOROU and SCHULTZ 2009.

73 In Crete, secondary forms of skeletal manipulation (skulls and a pile of human bones) have been also recorded at Koumarospilio, a cavern in Akrotiri, West Crete. The assumption was that seven burials, originally from Neolithic levels, were removed in the area of the west room passage during the FN (MANTELI 1993, 178, citing the work of JANTSEN 1951). It seems that in some northern areas of Crete, the intensive corporal deposition has begun by FN IV (TOMKINS 2012). Another example is the Trapeza cave in the Lasithi plateau. The cave was used as a habitation site during the Neolithic and as an ossuary in EM I to MM I. The stratigraphy in the cave was thoroughly disturbed (PENDLEBURY and MONEY-COUTTS 1935–36, 18–23). According to RUTKOWSKI and NOWICKI (1996, 75) the identification of the Trapeza cave in MM I, as a sacred cave, on the bases of ceramic vessels is a very weak argument.

74 The prevalence of porotic hyperostosis is very high, mainly in sub-adults individuals. The skulls indicate many traumas and three sophisticated trephinations (MCGEORGE 2008, 578–593).

75 TOMKINS 2012.

items indicate rather domestic activity.[76] However, ritualisation, provided that ritual was a distinct domain of everyday's activity, could be expressed by special kind of performances using common forms of vessels and consuming everyday food.

A heap of human bones and teeth, mixed with potsherds and other objects, has been revealed in a delimited area in the bottom of the cave; spare bones were also noticed in natural niches. As a whole, most of crania and long bones were missing. It is assumed, therefore, that the corporal assemblages from sector A provide evidence for a relocation of selected skeletal remains.[77]

Research questions awaiting further investigations

The function of Chamber B, a subsidiary room, has not been established. The frequency of the better preserved vessels could be assigned to mortuary behaviours (deposition of grave goods). Deliberate breakage of vases (or other items), in order to construct relations between people and objects as seen in other cultural contexts in the wider Aegean and the Mediterranean regions,[78] has not been proved so far. The precise dating of the remains exposed near the cave walls and cultural attitudes to corpse positioning (e.g. extended versus flexed) could not be detected. It is also unknown if secondary burials occurred in another place of the cave.

On the basis of uncovered evidence the following questions arise: was the cave used for other purposes (e.g. storage) than exclusively for burials?; was the cave sealed with rocks/stones by the end of LBA and only much later disturbed by new visitors/users? As the site's topography suggests, some attempt to block an access to the cave by moving rocks might indeed have taken place. Would the later visitors have removed all symbolic objects, if votive items have ever been deposited? Is there any convincing evidence of a cult function of the cave? The arguments about the cave being visited for cult purposes (veneration rites connected with the dead) are weak even if some of the eighteen of Colin Renfrew's indicators for a sacred place are fulfilled.[79] In any case, two examples can be cited: 1) certain parallels concerning the offerings between the tombs and the peak sanctuaries, had already been noticed in EM I – MM I Crete,[80] and 2) Mycenaean collective tombs were designated both to house the relics of the ancestors and to provide a focal point to perform ritual activities.[81] Considering the consolidation of collective tombs during LH III, a cave could assimilate to a tholos or a chamber tomb and encouraged ceremonials connected with the custom of secondary burial treatment.

Can the interaction between this site and the different LBA communities on Kythera be traced by placing the cave in its broader geographic context? Was the cave a local focal point on the Island or was it of an interregional importance? Can the bones reveal if the cave was designated for the ancestral corporal disposal of a single family (and used for generations) or was associated with much larger communities? New radiocarbon dates and genetic analyses, which may hold the key of the Late Bronze Age population, could eventually help to solve some problems. We can only hope that future research and material studies may bring answers to some of these above questions.

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[76] A clay spindle whorl (h. 14.3 mm; d. 24.6 mm; d. of the inner perforation 4.1 mm) of a conical profile was found in Sector B, layer 5, # 11.

[77] The disarticulated burials can be regarded as the outcome of a multi-stage funerary ritual and as the occasion build social relationships. The living could perform ceremonies (TODARO and GIRELLA 2013).

[78] The fragmentation could concern grave goods also (e.g. the marble figurines on Keros or the vessels at different mortuary sites (TODARO and GIRELLA 2013).

[79] RENFREW 1985, 18–20; WATROUS and WIDENOR 1996, 20–23 on the Psychro and other sacral caves in Crete.

[80] WATROUS and WIDENOR 1996.

[81] GALLOU 2004.

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